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THE MIND.

A well-cultivated mind is, so to say, made up of all the minds of the centuries preceeding.—Fontenelle.

Analysis of Bell Contract.

In the March 21 issue of TELEPHONY there was printed in full the form of contract to be used by the Bell company in making toll line service agreements, in accordance with the promise by the Bell to the United States Attorney General, made in what is known in telephone circles as the "Kingsbury Letter." The publication of that contract form has resulted in many inquiries for an explanation of the application of the contract to different exchange conditions. It seems, therefore, that a brief explanation of the situation is in order.

When the "Kingsbury Letter" was given to the public officially by the attorney general, and published broadcast by the newspapers, together with varying unofficial interpretations, there were many Independent companies which received the impression that the connecting regulations and terms of this agreement were to supplant the terms under which many of the Independent companies are now making toll connections with the Bell company. So strongly prevalent is this idea that the first statement which should be made and must be understood is: This new form of contract applies only to exchanges that are competing with Bell exchanges. It does not apply to any exchange in a city where there is not a Bell exchange. The statistical table published in TELEPHONY March 21 shows there are 15,258 Independent exchanges in the United States, and of these 1,234 are competing with Bell exchanges. Only to these 1,234, then, does this new arrangement apply. The remaining 14,024 may secure connections, or have done so, with Bell toll lines through the regular connecting agreements with Bell auxiliary companies—if the Independents desire such connections.

Having in mind, then, that the new form of contract is designed to cover the furnishing of toll line facilities to competitors for exchange business, it will be noticed that the first endeavor of the Bell company is to protect its exchange territory, and this has been done by three provisos that have attracted the most attention and provoked the most discussion.

The first condition is that no connections will be given by the Bell company to any point within 50 miles of the point within which the exchange is located with which the contract is to be made. This protects the local exchange area completely. The second proviso is that within a second zone, which shall be at least 50 miles from the exchange entering into the contract, there shall be no restriction as to connections, but a connecting fee of 10 cents shall be charged on every call. This is further protection to the exchange territory.

The width of this second zone will vary according to the territory in which the contracting exchange is located, but, generally speaking, will be governed by the territory limitations of the auxiliary Bell company. To points which are classed and which were classed December 19, 1913, as American Telephone & Telegraph Co. points, there will be given unrestricted toll connections. In this statement is the point to the whole agreement with the attorney general and to the contract to be made with Independent companies—the Bell company opens up its "long lines," those owned by the parent company, but hedges in its auxiliary and local company lines by restrictions that will, to a large measure, prevent the use of those lines by competitors.

The third proviso is that no commission is to be paid the Independent company for originating the business, nor for handling incoming messages. It is set forth indirectly that the competing Independent company is held to be much in the same position toward the Bell company as the individual subscriber of that Independent company is to that company. The Independent company is, therefore, designated as a subscribing company—a company that contracts for and pays for certain toll service. The individual

subscriber contracts with the Independent company and pays it for toll service. This subscriber pays in cash. The Independent subscribing company pays in services and the use of certain equipment. For this reason, because the Independent company is purchasing service, the contract provides for no commission for handling the business.

This, in brief, is the Bell contract offered now to owners of exchanges competing with Bell exchanges. The details of how those connections shall be made, operating methods, etc., are not the essentials—they can be submitted to arbitration, as provided in the contract—but the protection of its exchange territory and local toll lines is evidently regarded by the Bell company as vital and, therefore, the 10-cent connecting charge, the restriction as to connections within fifty miles, and no commission on business handled.

The Bell company has said on what terms it will furnish its toll line facilities to competitors. Whether those terms are too severe to warrant a company from accepting them, depends upon that company's conditions. Each company must judge for itself. The questions that confront each such company are: Does that company desire American Telephone & Telegraph Co. points sufficiently to be willing to pay for being able to furnish subscribers connections to those points? Does the commercial advantage offset the expense? Does the company need points just outside of its exchange area, over 50 miles from its exchange, badly enough to be willing to pay the 10-cent connecting charge and furnish terminal facilities? Each company must answer these questions for itself.

This is a clear interpretation of the agreement as TELEPHONY views it. We do not believe many competing Independents will sign it. The victory gained by this agreement, for Independents, lies in the fact that all Bell lines are declared common carriers and are available to over 14,000 Independents under most favorable conditions, and open to other Independent companies under restrictions.

The Greatly Humble

By HERBERT KAUFMAN

David, Perseus, Hector, Alcibiades, Aeneas and Damon are chronicled in eternal sentences. History has dipped her pen in the scarlet pools of uncounted battlegrounds.

To perish magnificently in a mountain pass that a nation may persist; to gather a breastful of hateful spears in the name of liberty; to take the round shot of an invading Armada; to lead a despairing charge and pitch headlong under the recording eyes of a brigade—these are splendid things and worthy of the best traditions of triumphant manhood.

To scale a precipice of brick and mortar and rescue a suffocating woman from a flaming building; to wade single-handed into a mob of ruffians and, in the name of the law, drag a rowdy from his gang; to leap before a team run amuck and halt the insane animals—these, too, are exploits which command the respect of us all.

There are heroes whose lives are lived in the shadows; there are lonely trails along which a nameless legion struggles without wish or will for praise; there is a silent company of threadbare folk who bear the burdens of unutterable woe and mean responsibilities with never a flinch nor whimper, and trudge to oblivion both unsung and unrequited. They are not privileged to die for others—they must suffer in patience and live out their drab, dreary, sordid years.

Theirs are simple careers. Theirs are unimportant deeds. They do not found empires, nor build cities, nor rescue the imperiled. But they serve God and man with magnificent self-abnegation. They lay aside ambition and labor for the weak and dependent.

They are brave in the dark, willing to forego the opportunities which selfishness surveys, because children and parents and brothers, who cannot stand alone, call to them for help. They surrender their chances with a superb magnanimity. They are great in little things. They eat the black and bitter bread of daily humiliation and slake their lives with the unshed tears of aborted hope.

Their dreams lie behind them, and promise is a shattered rainbow in their wake. Their names are lost to the world, but it is good to believe that there is elsewhere a page on which are inscribed the illustrious gentlemen who have been greatly humble.

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A Study of the Use and Preservation of Wooden Poles

A Critical Examination of Wooden Poles for Telegraph and Telephone Lines—The Extent of Their Use Throughout the World—The Question of Determining the Value of the Different Modes of Preservation and Species of Wood

By Dr. Friedrich K. Moll

A considerable sum of the expenditures of the telegraph and telephone administrations is formed by the expenses for the poles which bear the conducting wires leading over land. Since the introduction of the electric telegraph, about the year 1850, these poles, have been and are today almost exclusively of wood. To be sure, from the year 1870, when the great use of iron began, some attempts were made to supplant wood by iron. Thus we may find in some lines, chiefly in tropical countries, a considerable number of iron poles. In general, however, they have not come into great favor on account of being too expensive. Similar attempts have been made in recent years to substitute armed concrete for wooden poles, but as yet their superiority has not been proven. The price of concrete poles is, on the average, three times that of wooden poles, and the experiences from the use of the former, in many instances, have been rather unsatisfactory. Thus, in this article, we will deal mainly with wooden poles, and the special aim is to draw attention to the different modes of preservation and species of wood.

It is impossible to solve this task with mathematical exactness. In some of the years in which the statistics are taken, which form the basis of the communications of the various administrations, they are different; in other cases, only the reports of former years could be obtained. For many countries, including Russia and most of the South American states, numbers could only be estimated. In spite of these difficulties, the final result may be taken as being reliable. Owing to the gracious aid of most administrations, the writer was given exact references for three-fourths of the poles of the European systems. The United States, which carries on a very exact survey, possesses nearly four-fifths of all lines on the American continent.

Economic Importance of Wooden Poles.

Before entering into the matter itself, some general remarks will be made, illustrating the economical importance of the employment of wooden poles for telegraph and telephone lines. In spite of the fact that the statistics of the different administrations are based on different points of view, these statements made are approximately accurate. The number of the miles of lines refer only to lines with wooden poles.

It may be taken for granted that on the whole earth today there may be found about 60 to 70 million poles in the telegraph and telephone lines and some 15 million more in the lines for electric power and light. The states bordering the North Sea possess the densest telegraph and telephone net of Europe, having about 500 meters of lines and about 2,000 meters of conducting wires per square kilometer. Without taking into consideration the thinly populated Sweden and Norway, only the Balkan states, Spain, Portugal and Russia are below the average of Europe. The German Empire, including its railways, possesses the greatest net as to length as well as to density. In America, the United States has the most extended net of telegraph and telephone lines, the greater part of it being in the hands of five groups, viz., the Bell telephone companies, Western Union Telegraph Co., the Independent telephone companies, the Postal Telegraph-Cable Co. and the railway telegraph companies. The length and density of the net of the United States are nearly the same as of Europe.

For the total of the American continent, the density of the net is far below that of Europe. In Asia, as is not to be expected otherwise, undoubtedly Japan owns the best finished net. The total average of Europe is about 135 meters of line and about 600 meters of wire per square kilometer; of Asia, about 8 meters of line and about 25 meters of wire; of Africa, about 4.4 meters of line and 10 meters of wire per square kilometer. Today there may be extant some 3.7 million kilometers of overland lines with nearly 18 million kilometers of wire, which, referring to the continent, is equal to a density of 28 meters of line and 136 meters of wire per square kilometer. The average number of wires per pole is five, differing, of course, according to the special circumstances. Where there is but little communication, as in most Asiatic and African countries, the Balkan states, Spain and Portugal, there are about two wires to a pole, rising in the more densely populated countries bordering the North Sea, viz., Germany, The Netherlands, Belgium and Denmark, to its maximum. Further, while there are in Africa and Asia far above 100 inhabitants for each pole, this number in the properly developed countries varies around 10. These poles, including the cost of erecting them, figure out an expense of nearly 25 cents on each inhabitant of these countries.

Question One of Reasonable Forest Economy.

There is neither room here to deal more largely with the complaint of the continued wasting of woods, nor with the assertion that wood may not suffice in view of the rising need for poles. Mention may be made of the fact that in Germany, in spite of the continually increasing uses of wood, the area covered with forests is being extended a little from year to year. This question touches an entirely different subject, namely, that one of a reasonable forest economy. On the other hand it is obvious that by the present mode of working, as it is carried on in many places, considerable quantities of wood and poles are squandered without necessity.

Wood, as any other building material, is subject to wear and tear, to decay, usually caused in this instance by rotting—the effect of fungi. The regular wood economy will therefore try to preserve wood by apt measures against decaying. Though even these are not able to preserve wood for eternities, yet they may prolong their duration for double to fourfold the ordinary. The years since 1850 have developed a considerable number of such preserving and preparation measures and modes, and this action is not yet concluded, nor are the views quite settled.

In order to come to some approximately reliable conclusion, we must follow the statistics of long series of years, and try to get as comprehensive material for examination as possible. This latter is afforded, to the highest degree, by the compilations of the telegraph administrations. The most comprehensive works in this line, forming therefore the nucleus of this article, have been made by the German, Austrian, Dutch and French administrations, which, as well as those of the United States forest department, form very valuable material. In the following, the writer will first present the experiences of the different administrations and then give a concluding final statement.

By far the greater number of poles in Europe are pine. Five per cent. are leaf trees (oak and chestnut) and, likewise, nearly five per cent., fir tree and larch. The comparative homogeneousness of European pole material makes these sta-

tistics rather fit for a comparing estimation of the different modes of preservation, for it leaves the conclusion that differences in the average lifetime are chiefly due to climatic conditions in the various countries, chiefly owing to the different modes of preservation.

EUROPE.

1. Germany (Imperial Post and Telegraph Administration). The report published by Privy High Post Councillor Christiani, in the "Archiv," 1911, page 225, on the poles used since 1852, gives, up to the year 1909, 6,559,662 pieces. Details are given in the following table:

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Other processes	6.0	6.0
Untreated poles	7.0	5.0 pine 7.0 oak

The average duration of the poles exchanged on account of rottenness was found by Mr. Christiani to be as shown. In a paper by the writer, bearing on an older statistic (Archiv, 1905, page 505), the figures given in the table were found. In them account is also taken of the poles still contained in the lines. The statistic not having a separation after the years of insertion, as is given in the Austrian statistic, this ascertainment was only to be obtained by means of difficult calculations, which are described in the above mentioned paper (Archiv, 1910, page 673). From the beginning, the administration has inserted poles of all four of the foregoing processes of impregnation, at that time mostly employed, although very soon Boucherie treated poles became highly prevailing. Poles prepared in other ways have been set only on a small scale for the sake of trial, the result being unsatisfactory, compared with the four old proceedings; with an average insertion of six years, these poles did not ever come up with the untreated poles.

The zinc-chlorid process was not continued after 1880. The average duration of the 12.2 years of the exchanged 172,668 poles, will be only little augmented by the duration up to 40 years of the few zinc-chlorid poles still standing in the lines. For Boucherie poles an average duration of 14.5 years was calculated by the writer, being much in accordance with the French statement of 15 years, whereas Mr. Christiani's statement of 13.4 more nearly approaches the Austrian results. While, further, of the poles planted during the past five years, calculated on an equal annual insertion, there have been exchanged only 0.034 per cent. of creosoted poles and 0.12 per cent. of the kyanized poles on account of decay. The percentage is 0.42 for Boucherie poles. Mr. Christiani concludes his work with the words: "This survey at once allows to perceive that the Imperial Post & Telegraph Adiministration will cover the want of poles more and more with creosoted and kyanized wood, which is completely justified by the small waste of the named processes of impregnation."

The statistics having irrefutably shown the considerably higher duration and economical superiority of kyanized and creosoted poles to Boucheri poles, the latter process, once employed for nearly 90 per cent. of all treated poles, has been abandoned in favor of those other processes. Experiments have also been made to supplant copper vitriol by more efficacious salts. The annual demand for kyanized poles amounts to about 100,000; of creosoted poles from 150,000 to 200,000 pieces.

1b. German railways (only the Prussian-Hessian administration of railways). No total record is kept on account of the existing system being the result of the gradual buying up a great number of railway companies, there are in the lines, poles treated by different processes. In former years zinc-chlorid treated poles were prevalent, while Boucherie poles, from the beginning, have been employed only to a very small degree. Later on the mixing process (creosote oil with zinc-chlorid) came into favor and nowadays exclusively cresote impregnated poles are used. The number of poles set during the last five years is, on an average, 33,000 pieces, since 1907 all impregnated by the Northheimer and Ruping processes. There are no statements regarding the duration of the poles, yet it may be estimated as high as with the Imperial Post & Telegraph Administration.

1c. Bavaria. The Bavarian Administration of Telegraphs has inserted besides few Boucherie poles, only kyanized ones (789,909 kyanized, 15,109 Boucherie poles). On account of the kyanized poles being satisfactory, exact statements have not been made. Calculations made for some lines proved a duration of 17.5 years on the average (Communication by the High Councillor Novotny, Vienna, Zeitschrift for Post & Telegraph 1911). The annual requirements are roughly 70,000 poles.

1d. Wurttemberg. Here are circumstances similar to Bavaria. At the meeting of governmental telegraph engineers, in Paris, in 1910, Mr. Ritter stated that the average duration of kyanized poles to be 15.6 years; according to a more recent report, it amounts to 16.5 years. A good result has been gained by putting old poles affected on the bottom into cement bases, by which means a prolongation of duration is hoped to be obtained, similar to the poles standing in stone, at bridges, etc.

2. Belgium. While formerly, poles of different preparation stood in the lines, since 1890 only poles are employed which are impregnated with creosote oil in the royal plant at Ostende. The absorption of oil is 250 kilograms per cubic meter of wood (17 pounds per cubic foot). In recent days the empty cell method, Ruping, has been tried. Some few poles, too, impregnated with sublimate and furnished from private plants are to be found in the lines. These poles are remarkable for being impregnated under pressure. The quick corrosion of the boiler by the sublimate hindered further experiments in this line. Recently a number of native fir poles, treated by the Boucherie process, have been set. Fir presents great difficulties to treatment with creosote oil, though, on the other hand, forest economy is interested in making as much use of this wood as possible. No decisive results are known at present. Apart from these experiments, the total amount of poles per annum, roughly, 25,000, is treated with creosote oil.

3. Bulgaria. Though the Bulgarian Railway Administration possesses two Imperial plants, the telegraph administration had only an insignificant part of its poles prepared there. Not only are the conditions of transportation unfavorable in this country, especially in the Balkan provinces, but also the great importance of an artificial protection of wood is not sufficiently believed in. Wood, especially young oak, is comparatively cheap. The duration of the poles is roughly estimated at 12 years. The advantage of a special treatment is thought to be fully balanced by the high cost of transportation to and from the establishment. There are 114,000 poles contained in the state's lines.

4. Denmark. The Danish lines, for the greater part, are in the hands of private companies. As is shown by several articles in the periodical, "Ingeniören," the question of wood preservation receives much attention. The Jutlandie Telephone Co. has, in its lines, poles of different preservation. Thus in 1905, 1,410 poles preserved by Boucherie process in the royal establishment of "Sorö," were set. These poles gave a result as unfavorable as copper vitriol impregnated pine poles, set in earlier years. Today, full-creosoted pine poles are employed exclusively. Since 1898 these have been obtained from Norway. The removal of these during the last 12 years has been insignificant. Since 1906 the Forenede Sydjyske Telefonselskab, too, has totally abandoned the use of copper vitriol impregnated poles on account of the poor results obtained, the average duration being hardly 10 years, and nowadays exclu-

sively employs poles impregnated by an empty cell process (Rüping).

The lines of Fyns Kommunale Telefonselskab use pine poles impregnated with a mixture of zinc-chlorid and creosote oil. These lasted comparatively well while later inserted Boucherie poles (fir) for the greater part, are already rotten. None of the full impregnated creosote oil poles set in late years have shown decay.

The governmental telegraph has no statistics. Boucherie poles are employed, treated in the royal plant of "Sorö." They have lasted satisfactorily.

Finally the Royal Telephone Co., Inc., had from 1894-1903 nearly 20,000 fir poles prepared with a mixture of zinc-chlorid, and creosote oil, the greater part of which, however, very soon were lost. To be sure, the cause is to be found in fir wood, which is very difficult to treat. Pine wood, treated in the same manner, though inferior to poles full impregnated with pure creosote oil, is very superior to fir wood.

Nowadays in Denmark, about half the number of poles required consists of creosote oil poles, chiefly pine poles, even though they must be obtained from abroad.

5. England. In England, poles are treated almost exclusively by the Bethell process., i. e., they are fully impregnated with creosote oil under pressure. In some few localities, there are also taken, on account of their appearance, zinc-chlorid poles. Requests concerning admission of other methods of impregnation have, to the writer's knowledge, always been refused. No record is now kept because of the degree of belief in the superiority of poles full impregnated with creosote oil, to all other methods. In the very first days of telegraphy, the Boucherie method, too, was greatly in favor in England. Then poles impregnated by the Bethell process, inserted in 1848, gave a result so satisfactory that the attempt was repeated on a greater scale. Over a distance of 40 miles, alternately one untreated pole, one Boucherie pole and one creosoted pole were set. Ten years later all of the untreated poles and 30 per cent. of the Boucherie poles had been removed while all creosoted poles had lasted. In the first line constructed by Bethell, likewise, all poles were still in good condition and when this line was to be reconstructed, in 1883, no poles had yet been lost, thus showing a duration of 35 years. In consequence of this favorable report, after 1880 only creosoted poles were set. The wood is Swedish and Norwegian pine, in English articles often falsely called "fir."

All private companies followed the example of the administration, so that England may be termed the classical land of creosote oil impregnation. In a letter by an English authority is the statement, "As far as I am able to judge, I deem it highly improbable that we should abandon this method. You may be sure that a sound pine pole, well seasoned and well creosoted will endure a generation, and you may take the word 'generation' as liberally as you deem fit. In most cases the poles must be removed before they are worn out, because in the long years of their duration, the number of the lines of wires has so greatly increased that stronger poles are needed."

In a report, Wade quotes a number of altered lines, all of the poles of which stood 24 to 35 years, few only showing decay when the line was reconstructed. Of recent English papers, there is a remarkable report of Mr. Henley before the telegraph engineers meeting in Paris, in 1910, in which, based on a series of break trials, the proof was furnished that treated poles, even after 30 years standing in the line, had not lost a bit of their mechanical strength.

Before the recent acquisition of the National Telephone Co., the governmental lines contained about 500,000 poles, over 95 per cent. of which were creosoted. The annual requirements were roundly, 50,000. There are no exact figures available of the English private lines, as to the annual requirement of poles. Nearly everywhere full creosoted poles are used, other methods being infrequently used. The Haskin method (vulcanizing) was a complete failure, and according to a communication to the writer, plants of this kind have been reconstructed.

6. France. As creosoting is peculiar to England, so is the Boucherie method to France. The telegraph administration, as well as the private railway companies, treat their poles with copper vitriol. This method is as strongly believed in today as it was 50 years ago, when its inventor, the physician, Dr. Boucherie, received the highest national honors and even his privilege was prolonged by special imperial favor. No comparisons with other methods are known. The material of poles is native fir and especially pine, of which France has some species of excellent quality. The average duration is given as 15 years, a value rather near to the 14.5 years calculated by the writer for Germany. Though the result may be considered as satisfactory, yet we may not leave unnoticed some points of a report by the head of the French telegraph administration, Mr. Massin, before the telegraph engineers' meeting.

The Injectol Treatment.

In his report we are informed that one does not content himself with simple preserving but that each pole receives on its top, a special painting of ochre and zinc white reaching down 10 centimeters and that in many places the poles are given a butt treatment with "injectol," a kind of creosote. Both processes, of course, cause a great increase in the cost, and the question is whether it may not be more profitable to pass over to a more efficient method. The creosote oil method is strongly objected to, because the high temperature of Southern France causes too much exuding and evaporation of the oil out of the poles. On the other hand, the painting with injectol can not be called a very efficacious measure, though until recently, there was a certain superiority of these poles to merely copper vitriolized poles, obvious in the experimental lines. But is is not at all certain that it will keep on.

Injectol is a mixture of light carbureted hydrogen, entering very easily into the wood, but it is also known that those oils will as easily and as quickly volatilize again, even phenols of higher boiling point, and when mixed with heavy creosote oils, disappearing completely out of the wood after two or three years. Today there are whole lines where, as in Austria, Boucherie poles must be removed nearly every year or every second year, and it is known from experience that decay, the cause of which is to be seen in infection of the ground by fungi, spreads epidemically. Such centers of decay once formed, copper vitriol is not able to hinder its spreading. The painting of the top and the preserving of the bottom with injectol, may be looked at as the harbinger of a new period in the French preservation technics. Other processes have been but little tried until recently, so that there is not sufficient data available. The number of poles amount to about 3,250,000.

7. Greece. There is no preservation of poles. The material of poles shows little duration and solidity.

8. Italy. With its want of wood, Italy greatly depends upon foreign countries. Of native woods, chiefly chestnut is employed, which is charred on the bottom of the pole. The duration of 10 years seems small. From abroad there come impregnated pine and fir poles. No experiences being recorded, every method is allowed that has gained a wider reputation abroad or that seems fit. In the south of the country, Rüping works with an empty cell process with creosote oil. From Austria, Boucherie poles are introduced and German firms provide kyanized ones. The latter ones seem to be the most suitable for Italy, considering the great dryness and heat of the country. The "dipping method" with creosote oil (Giussani process), as practiced by a Milanese firm, is largely patronized, as a native one, although according to information received, it but slightly meets expectations.

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1c. Bavaria. The Bavarian Administration of Telegraphs has inserted besides few Boucherie poles, only kyanized ones (789,909 kyanized, 15,109 Boucherie poles). On account of the kyanized poles being satisfactory, exact statements have not been made. Calculations made for some lines proved a duration of 17.5 years on the average (Communication by the High Councillor Novotny, Vienna, Zeitschrift for Post & Telegraph 1911). The annual requirements are roughly 70,000 poles.

1d. Wurttemberg. Here are circumstances similar to Bavaria. At the meeting of governmental telegraph engineers, in Paris, in 1910, Mr. Ritter stated that the average duration of kyanized poles to be 15.6 years; according to a more recent report, it amounts to 16.5 years. A good result has been gained by putting old poles affected on the bottom into cement bases, by which means a prolongation of duration is hoped to be obtained, similar to the poles standing in stone, at bridges, etc.

2. Belgium. While formerly, poles of different preparation stood in the lines, since 1890 only poles are employed which are impregnated with creosote oil in the royal plant at Ostende. The absorption of oil is 250 kilograms per cubic meter of wood (17 pounds per cubic foot). In recent days the empty cell method, Ruping, has been tried. Some few poles, too, impregnated with sublimate and furnished from private plants are to be found in the lines. These poles are remarkable for being impregnated under pressure. The quick corrosion of the boiler by the sublimate hindered further experiments in this line. Recently a number of native fir poles, treated by the Boucherie process, have been set. Fir presents great difficulties to treatment with creosote oil, though, on the other hand, forest economy is interested in making as much use of this wood as possible. No decisive results are known at present. Apart from these experiments, the total amount of poles per annum, roughly, 25,000, is treated with creosote oil.

3. Bulgaria. Though the Bulgarian Railway Administration possesses two Imperial plants, the telegraph administration had only an insignificant part of its poles prepared there. Not only are the conditions of transportation unfavorable in this country, especially in the Balkan provinces, but also the great importance of an artificial protection of wood is not sufficiently believed in. Wood, especially young oak, is comparatively cheap. The duration of the poles is roughly estimated at 12 years. The advantage of a special treatment is thought to be fully balanced by the high cost of transportation to and from the establishment. There are 114,000 poles contained in the state's lines.

4. Denmark. The Danish lines, for the greater part, are in the hands of private companies. As is shown by several articles in the periodical, "Ingeniören," the question of wood preservation receives much attention. The Jutlandie Telephone Co. has, in its lines, poles of different preservation. Thus in 1905, 1,410 poles preserved by Boucherie process in the royal establishment of "Sorö," were set. These poles gave a result as unfavorable as copper vitriol impregnated pine poles, set in earlier years. Today, full-creosoted pine poles are employed exclusively. Since 1898 these have been obtained from Norway. The removal of these during the last 12 years has been insignificant. Since 1906 the Forenede Sydjyske Telefonselskab, too, has totally abandoned the use of copper vitriol impregnated poles on account of the poor results obtained, the average duration being hardly 10 years, and nowadays exclu-

sively employs poles impregnated by an empty cell process (Rüping).

The lines of Fyns Kommunale Telefonselskab use pine poles impregnated with a mixture of zinc-chlorid and creosote oil. These lasted comparatively well while later inserted Boucherie poles (fir) for the greater part, are already rotten. None of the full impregnated creosote oil poles set in late years have shown decay.

The governmental telegraph has no statistics. Boucherie poles are employed, treated in the royal plant of "Sorö." They have lasted satisfactorily.

Finally the Royal Telephone Co., Inc., had from 1894-1903 nearly 20,000 fir poles prepared with a mixture of zinc-chlorid, and creosote oil, the greater part of which, however, very soon were lost. To be sure, the cause is to be found in fir wood, which is very difficult to treat. Pine wood, treated in the same manner, though inferior to poles full impregnated with pure creosote oil, is very superior to fir wood.

Nowadays in Denmark, about half the number of poles required consists of creosote oil poles, chiefly pine poles, even though they must be obtained from abroad.

5. England. In England, poles are treated almost exclusively by the Bethell process., i. e., they are fully impregnated with creosote oil under pressure. In some few localities, there are also taken, on account of their appearance, zinc-chlorid poles. Requests concerning admission of other methods of impregnation have, to the writer's knowledge, always been refused. No record is now kept because of the degree of belief in the superiority of poles full impregnated with creosote oil, to all other methods. In the very first days of telegraphy, the Boucherie method, too, was greatly in favor in England. Then poles impregnated by the Bethell process, inserted in 1848, gave a result so satisfactory that the attempt was repeated on a greater scale. Over a distance of 40 miles, alternately one untreated pole, one Boucherie pole and one creosoted pole were set. Ten years later all of the untreated poles and 30 per cent. of the Boucherie poles had been removed while all creosoted poles had lasted. In the first line constructed by Bethell, likewise, all poles were still in good condition and when this line was to be reconstructed, in 1883, no poles had yet been lost, thus showing a duration of 35 years. In consequence of this favorable report, after 1880 only creosoted poles were set. The wood is Swedish and Norwegian pine, in English articles often falsely called "fir."

All private companies followed the example of the administration, so that England may be termed the classical land of creosote oil impregnation. In a letter by an English authority is the statement, "As far as I am able to judge, I deem it highly improbable that we should abandon this method. You may be sure that a sound pine pole, well seasoned and well creosoted will endure a generation, and you may take the word 'generation' as liberally as you deem fit. In most cases the poles must be removed before they are worn out, because in the long years of their duration, the number of the lines of wires has so greatly increased that stronger poles are needed."

In a report, Wade quotes a number of altered lines, all of the poles of which stood 24 to 35 years, few only showing decay when the line was reconstructed. Of recent English papers, there is a remarkable report of Mr. Henley before the telegraph engineers meeting in Paris, in 1910, in which, based on a series of break trials, the proof was furnished that treated poles, even after 30 years standing in the line, had not lost a bit of their mechanical strength.

Before the recent acquisition of the National Telephone Co., the governmental lines contained about 500,000 poles, over 95 per cent. of which were creosoted. The annual requirements were roundly, 50,000. There are no exact figures available of the English private lines, as to the annual requirement of poles. Nearly everywhere full creosoted poles are used, other methods being infrequently used. The Haskin method (vulcanizing) was a complete failure, and according to a communication to the writer, plants of this kind have been reconstructed.

6. France. As creosoting is peculiar to England, so is the Boucherie method to France. The telegraph administration, as well as the private railway companies, treat their poles with copper vitriol. This method is as strongly believed in today as it was 50 years ago, when its inventor, the physician, Dr. Boucherie, received the highest national honors and even his privilege was prolonged by special imperial favor. No comparisons with other methods are known. The material of poles is native fir and especially pine, of which France has some species of excellent quality. The average duration is given as 15 years, a value rather near to the 14.5 years calculated by the writer for Germany. Though the result may be considered as satisfactory, yet we may not leave unnoticed some points of a report by the head of the French telegraph administration, Mr. Massin, before the telegraph engineers' meeting.

The Injectol Treatment.

In his report we are informed that one does not content himself with simple preserving but that each pole receives on its top, a special painting of ochre and zinc white reaching down 10 centimeters and that in many places the poles are given a butt treatment with "injectol," a kind of creosote. Both processes, of course, cause a great increase in the cost, and the question is whether it may not be more profitable to pass over to a more efficient method. The creosote oil method is strongly objected to, because the high temperature of Southern France causes too much exuding and evaporation of the oil out of the poles. On the other hand, the painting with injectol can not be called a very efficacious measure, though until recently, there was a certain superiority of these poles to merely copper vitriolized poles, obvious in the experimental lines. But is is not at all certain that it will keep on.

Injectol is a mixture of light carbureted hydrogen, entering very easily into the wood, but it is also known that those oils will as easily and as quickly volatilize again, even phenols of higher boiling point, and when mixed with heavy creosote oils, disappearing completely out of the wood after two or three years. Today there are whole lines where, as in Austria, Boucherie poles must be removed nearly every year or every second year, and it is known from experience that decay, the cause of which is to be seen in infection of the ground by fungi, spreads epidemically. Such centers of decay once formed, copper vitriol is not able to hinder its spreading. The painting of the top and the preserving of the bottom with injectol, may be looked at as the harbinger of a new period in the French preservation technics. Other processes have been but little tried until recently, so that there is not sufficient data available. The number of poles amount to about 3,250,000.

7. Greece. There is no preservation of poles. The material of poles shows little duration and solidity.

8. Italy. With its want of wood, Italy greatly depends upon foreign countries. Of native woods, chiefly chestnut is employed, which is charred on the bottom of the pole. The duration of 10 years seems small. From abroad there come impregnated pine and fir poles. No experiences being recorded, every method is allowed that has gained a wider reputation abroad or that seems fit. In the south of the country, Rüping works with an empty cell process with creosote oil. From Austria, Boucherie poles are introduced and German firms provide kyanized ones. The latter ones seem to be the most suitable for Italy, considering the great dryness and heat of the country. The "dipping method" with creosote oil (Giussani process), as practiced by a Milanese firm, is largely patronized, as a native one, although according to information received, it but slightly meets expectations.

9. Luxemburg. There are used only poles fully impregnated with creosote oil, (Bethell process). The duration is declared to be 30 years. Great importance is attributed to a high standard of tar acids. Considering that in a system of nearly 23,000 poles, in the last years, only 14 had to be removed on account of decay, we may accept this as a good point in favor of the method of preservation which has been employed in this country.

10. Montenegro. Does not preserve any poles.

11. The Netherlands. On the treatment of poles, Mr. Collette, chief engineer of the administration, has published a paper made up from his report at the telegraph engineers' meeting at Paris. According to it, up to 1900 chiefly Boucherie treated poles were set. Since 1910, according to another authority, requirement is made up with kyanized poles, about which, however, the time being too short, nothing may be said. The loss of Boucherie poles shows a striking correspondence with German poles of the same kind.

The average duration of the poles removed amounted to 11.2 years, until the year 1910, the corresponding number for Germany being 11.7. The actual average duration is taken to be 15 years by Mr. Colette, who also takes note of the fact that we cannot at all compare the removed poles with the whole number. Comparing the French statements and the number of 14.5 years calculated by the writer for the German lines, with this number of 14 years, this one seems to come nearest to the actual average duration. Creosote impregnated poles are not employed in the Netherlands, because of having too many unpleasant effects. Experiment has been made with setting 6,000 Rüping poles, which, however, has not given a decisive result. The price too, of creosoted poles is so high that, considering the utmost probable increase in the strain on the lines and the frequent rebuilding of the lines caused thereby, a proper economic basis is not to be had, because such a basis is possible only with full exhaustion of the whole duration of these poles.

12. Norway. Up to the year 1910 only copper vitriol impregnated poles have been employed. In 1911, for the first time, creosote oil preserved poles were set, furnished from the new government plant at Lillestroemen, working with the Rüping empty cell method. The yearly insertion is about 10,000 poles. The average duration of Boucherie poles is declared to be 15 years. Thus it seems that pine Boucherie poles are not excessively subjected to special climatic and race peculiarities, for the number of 15 years is given by nearly all European administrations employing such poles. While the poles set about the year 1860 have kept exceedingly well, later on more unfavorable experiences have resulted in a great falling off in the average duration. At present it has arrived at the above quoted number of 15 years. Where there were no establishments near, the Boucherie preservation has been stopped since 1870 and the poles have been well dried and painted with creosote oil at the place of their cutting. These poles proved to keep as well as the Boucherie poles. Therefore the painting method is practically today in remote parts of the country. Full creosoted poles set since 1890 in considerable number were exceedingly satisfactory.

13. Austria. While in Germany a great number of poles prepared after the four old methods is so valuable for the critical examination of such methods, in Austria the great trials with the fluor salts introduced into the preservation technics in most recent times by the engineer captain, Malenkowicz, are of great importance. These trials comprise about 20,000 poles since 1906. The short space of time does not yet allow a definite judgment, though some of these methods seem to be superior to the Boucherie method. These experiments were made on account of the continually increasing complaints on the partially total insufficiency of the Boucherie method. In places where the average duration of the first inserted generation had amounted up to 25 years, with the second, it had sunk to five years, and then even down to two or three years.

Investigations furnished the conviction that in a line infected with fungi, "copper vitriol must be denied any right of passing for a wood conserving substance." Trial poles were at first inserted in the most infected lines and apparently have, until now, kept better, by far, than Boucherie treated poles. The record, however, showing that the average duration of Boucherie treated poles throughout the kingdom, generally declared to be 15 years, and being not much inferior in the older Austrian lines, had sunk in 1906 down to 11.8 years, the definite result could not be waited for; and thus, after careful investigations, the administration resolved to give up a great number of the Boucherie plants and to introduce in their place, kyanizing and creosoting. Today there are in Austria five great kyanizing and about 10 creosote oil plants.

The great setting of untreated poles in Austria is remarkable. In the Alpine districts where transportation is difficult, the rather solid red larch furnishes exceedingly good poles. These poles, which in the plain fall off remarkably, show an average duration of 9.1 years and here (Corinthia, the Tyrol and Steirmark) are even superior to Boucherie poles. In parts of little developed intercourse, too, as in the Bukowina, Galicia, etc., about 4,000 unteated chestnut and 46,000 untreated oak poles are inserted. Here the cost of transportation would have consumed the gain obtained from longer duration.

14. Bosnia and Herzegovina. Until recent days only untreated wood was employed. Now a small plant working with creosote oil and one with Kyan's process have been built.

15. Portugal. Exact statements are wanting. It may be assumed that part of the poles, as in Spain, is preserved by the Boucherie process, and the rest inserted untreated. Experiments, too, are said to have been made with cresote oil.

16. Roumania. No measures of preservation have come to the writer's knowledge. The railway administration possesses a plant for purposes of its own. It is probable that on account of the bad roads, most of the poles are set untreated, as is done in the whole Orient.

17. Russia. Russia owns in her vast forests, at least for the present, an immensely rich source of wood, so that the question of an artificial protection of the poles has not yet become urgent. By far the greater part of the poles are pine, inserted, almost exclusively, untreated. Occasionally they are charred on the butt end, or other native expedients are employed. Regular investigations are wanting. As a mark of a modern rising era, a book published recently, entitled, "The House Fungus," by Prof. Ilkewitsch of Moscow, may be mentioned. It is considered one of the best works on the destruction of wood by fungus, which has ever been published.

18. Finland. Of the telegraph lines in Finland, those on the railways recently were provided with poles impregnated with creosote oil by the Rüping process.

19. Sweden. About half of the approximately 570,000 Swedish poles have been prepared with copper vitriol or with creosote oil. The Boucherie method is favored on the whole, because the establishment pays the expenses on small quantities and, also, can be moved from place to place. This latter point is of great importance, considering the vastly extended country, the comparatively thin telegraph net and the few railway communications. In the greater centers, creosote oil impregnation is preferred, the method being the empty cell process, with 125 kilograms of oil per cubic meter (8 pounds per cubic foot) of wood. The Swedish government railways have a creosote plant of their own and have completely dropped the Boucherie proceeding.

According to a proposal by Heidenstamm in recent days, too, cresol calcium is employed, a substance similar to creosote natrium, which results as waste in German and English lignite mines where it has been used for a long time in preserving wood.

(To be continued.)

The Rejuvenation of the Craneville Telephone Exchange

A Serial Story Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery Metallic System and Later to Common Battery —Problems Encountered by Every Practical Telephone Man

By Paul Hamilton

"I've got a crank here that won't ring, Frank," said Germany, who had been testing out some instruments.

"Can't you find out what's wrong with it? Get Doc to help you."

"Doc don't know, either."

"I'd get a new crank if I were you."

"He don't mean just the crank, he means the whole machine. It turns all right, but it won't ring the bells," the Doctor explained. "We have had it all to pieces and maybe we didn't get it together right."

The three men very carefully examined the hand generator in question, but could not discover the cause of the trouble. Germany finally grew impatient and appealed to Mr. Barrows.

"He would ring good and I took him to pieces to clean him up and now he won't ring any at all," Germany explained.

"Rather ungrateful, isn't he?" Mr. Barrows remarked, placing his fingers across the poles of the generator and giving the armature a steady turn.

"In all probability there is one of three things the matter with it. The winding of the armature may be open. Get about five dry cells and connect them in series. Now by placing the battery and a receiver in series between the poles, we find the windings are not open so we can cross off number one.

"It is also possible that the windings are short circuited or crossed with the frame of the machine. Put one side of the battery to the winding and 'feel' out the different parts of the frame with the receiver clip. No sign of a cross anywhere, so cross off number two."

"If you had found the trouble in either of those places, how would you have cleared it?" Germany asked.

"It would not have been worth while to have attempted it. Work of that kind requires tools and equipment found only in shops and laboratories," replied Mr. Barrows. "Now for the other possibility. Let me have a screwdriver and I will take off the magnet bars. I will lay them down with the poles exactly as they were on the machine. There they are! You see they attract each other so strongly that you can lift them all by lifting the last one I laid down."

"Isn't that all right?" asked Frank. "We used to test our receivers with a weight."

"But this is a different proposition. It's like this. Here is the way the magnets were placed (Fig. 78-*A*). One south pole was between two north poles on one side and a

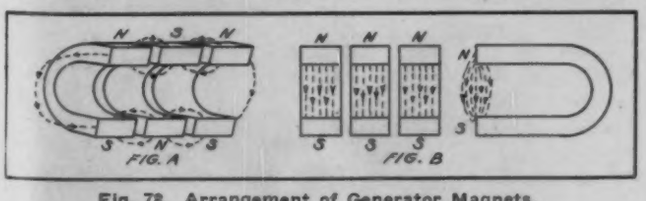


Fig. 78. Arrangement of Generator Magnets.

north pole between two south poles on the other. The magnetic lines of force extended between the poles to opposite poles on each side of the armature. Thus very few, if any, lines of force passed through the armature and no current was generated. By reversing the middle bar, the lines of force must cross the armature space to reach a pole of opposite polarity (Fig. 78-*B*). When we turn the armature, these lines are cut, generating current."

"How can we tell when the magnets are right?" Frank inquired.

"Very easily. When placed as they should be, with like poles together, there is no attraction between any or

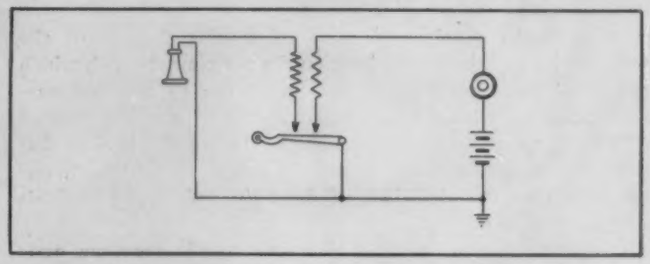


Fig. 79. Simplified Local Battery Circuit.

either of them, as you see. Now by reversing one, there is a pole of opposite polarity on each side or in each group and thus there is an attraction between them."

"When they don't stick together, they are right already?" queried Germany.

"Yes, if there is any magnetic life in them."

"Can you knock the magnetism out of them?" Frank asked.

"Yes; you have it exactly. You can knock the magnetism out of a piece of steel with a sharp blow. A sudden blow appears to confuse the atoms, or causes them to rearrange themselves so their magnetic power, or magnetism, is gone."

"Can't it be put back again?"

"That is the mysterious part of it. By bringing it into contact with another magnet or by proper electrical treatment it regains its power of attraction. While the magnet from which it regains its power is said to be even stronger than before."

"All right. I set him up again and see him ring," said Germany.

"I haven't anything particular in mind for tomorrow evening. If you can find something along the line of this case of trouble, we will have something to start from."

"Is that all the trouble that can come in on a generator?" Frank asked.

"I would not say that, but those are the most common. Dirt probably is the cause of more trouble than anything else. That was probably what caused the trouble Germany was looking for."

Mr. Barrows suggestion that the boys bring in their particular cases of trouble was made for two reasons. He had overheard a few words exchanged between Frank and Germany on several occasions which indicated that they had certain problems under discussion between them. He surmised that they had come upon cases of trouble which puzzled them but which they considered too simple to be brought up for discussion.

He had a further object in view. He had had little time to make many personal inspections of instruments. From the trouble tickets, he found that in a few instances the same trouble had been reported several times in succession on cer-

tain instruments. Several of these chronic cases had been cleared by changing the instruments. From the meager information gleaned from the reports, it was obvious that an oversight had occurred. Either the instrument should have been changed after the first inspection or the trouble cleared by changing only a defective part.

His idea of economy of maintenance was not entirely along

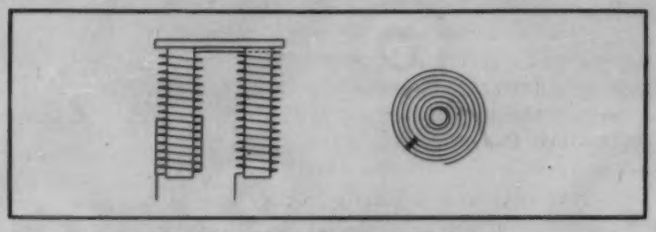


Fig. 80. Short Circuit in Bell Coil.

the line of the number of cases of trouble throughout the plant, but he took into consideration the permanency with which each case was cleared; also the prevalence of any one particular kind of trouble which might be due to a wrong method of installation or poor workmanship. He did not believe that either Frank or Germany would be guilty of the latter, except through a mistaken idea of the right and wrong methods of doing the work.

"I remember one question Germany asked sometime ago; before we were ready to go into trouble questions," Mr. Barrows began by way of opening the evening discussion. "It referred to the transmitter. Did you ever find out what made it go 'z-z-z-z-z,' Germany?"

"Once in a while something; once a loose wire under a screw; once a bum cord by the receiver," Germany answered.

"Did you ever find one you could not cure in some way?"

"Yes, one already. We have him upstairs. We tried him on two or three sets."

"I think it is inside the transmitter," said Frank. "It will quiet down and then when you speak in it, it begins to sizzle and keeps it up for a long time."

"The fact that you substitute another transmitter and clear the trouble proves its source is in the transmitter. The peculiar sizzling sound is caused by a variation of the flow of current through the receiver. The standard or fixed place for this variation is in the transmitter where it can be regulated. But a loose connection in the circuit cuts down or increases the resistance and also affects the flow of current.

"Here is the simplified circuit (Fig. 79). A loose connection at any point in this circuit, even if not sufficient to cut off the battery entirely, will cause the receiver coil to vary in its magnetic strength, which agitates the diaphragm. Since we are certain all the connections in the circuit are in good condiiton, there is but one other place to look for the trouble,

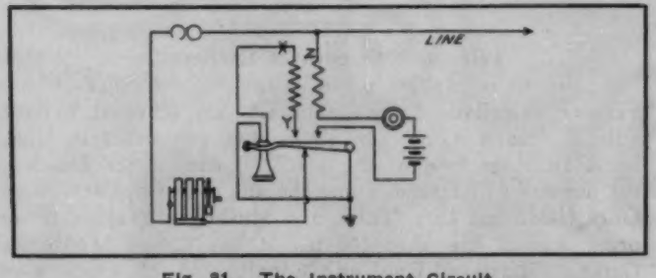


Fig. 81. The Instrument Circuit.

viz., in the transmitter itself. We discussed packed transmitter carbon granules which do not allow any or sufficient vibration. In this case we have the opposite extreme. The grannular are so loose they vibrate without any definite action of the transmitter diaphragm. It is a case we will not attempt to clear."

"I got another one here," said Germany. "This bum bell, he rings sometimes, but not good. He goes pretty good if you start him, but most on one side."

"I have a generator lead over here now, so we can connect it and see what is the matter," responded Mr. Burrows.

The bell in question, when connected to the generator, gave a spasmodic flutter and held tremblingly to one coil. When pushed free, it would flutter and snap back again; the adjustment of yoke and armature did not improve it.

"For some reason or other one coil is dead; that is, the core is not magnetized, as it should be, by the current passing through the windings. There is only a very slight effect as you can see when I hold the armature over very close to the core. A part of the windings are shorted out, like this.

"You see the current, instead of following a proper path through all the windings, finds a course offering less resistance (Fig. 80). For that reason the lines of force set up by the current do not meet or cut the magnetic lines of force in sufficient number to properly affect or control the armature."

"There are methods or means of measuring the resistance of coils, etc., I believe?" interposed the Doctor.

"Oh yes! There are instruments for that purpose which are exceedingly accurate but their cost is an expense which I cannot justify for the little use we would have for them here."

"We have a set upstairs that has puzzled us a lot," said Frank. "If we hook it up right, we can't hear over it but by changing it a couple of different ways, we can hear some

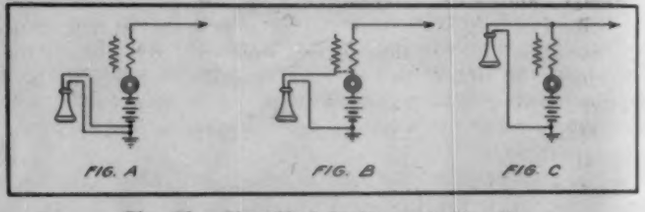


Fig. 82. Simplified Instrument Circuit.

but can't talk as well. It's like this," and Frank drew a sketch of an instrument circuit (Fig. 81) from memory.

"Now it won't work; you can't hear. If I open the receiver at *X* and connect it at *Y*, we can hear some."

"Let's see before we go any further. We'll simplify this circuit a little and see the effect (Fig. 82). Here I have omitted the secondary of the coil (Fig. 82-*A*) and you see what we have—no circuit at all for the receiver. Now take it like this (Fig. 82-*B*) having one end of the secondary coil connected to the receiver and disconnected from the hook contact. That is the way you must have connected it, so your coil must be short circuited. That, of course, would make talking from this instrument very difficult."

"It did, but I found a way to hook it up so we could talk and hear both like this (Fig. 81). I put the receiver on here at *Z*."

"Well that wasn't very much different from the other way (Fig. 87-*B*). It's like this (Fig. 82-*C*). That might help your talking circuit a little," said Mr. Burrows.

"I had one the other day," said Germany, "that would ring already with the door open but no ring when the door was shut?"

"Didn't you find that trouble?" Frank asked.

"I didn't find him for sure, but I cleared him."

"How did you clear it and not find it?" Mr. Burrows inquired.

"Well, I put tape on the binding posts that I think the door hit when I shut him."

"Couldn't you tell if the door hit against something?"

"I can't see through a wooden door, Frank, and I guess you can't either."

"After you found the trouble, you should have moved the

posts to clear the door," Mr. Barrows advised. "Well, Doctor, we haven't heard from you all evening. What have you on your mind? I see you have been studying those coils pretty carefully."

"Several things have come into my mind but I guess I'll try to puzzle some of them out myself. It is a little late anyway. I'd like to get a nap before the midnight rush begins. There are always two or three calls after the night express goes through."

"All right, Doctor. I guess the rest of us can stand a little sleep also."

(To be continued.)

Telephone Service Paralyzed at Worcester, Mass.

One of the worst tie-ups in the history of the New England Telephone & Telegraph Co., occurred on the morning of March 28 at the Worcester, Mass., exchange, as a result of damage by water in fighting a small fire within the building. About 20,000 telephones are normally in service at Worcester, which is the third largest city in New England, with a population of about 150,000. The fire occurred about 3 a. m., and the operators on duty at the time escaped without serious difficulty. Emergency crews were summoned from Boston, New Haven, Springfield, Portland and Pittsfield, soon after the fire broke out, and within half an hour after the fire was over, reconstruction had begun under the direction of District Manager, C. J. Abbott.

The local service was completely paralyzed through water damage, and after attempts to dry out the cables in the distributing room, it was found necessary to cut many sections out and splice in new pieces. By noon Chief Engineer Manson, General Superintendent of Traffic B. J. Bowen; General Superintendent of Plant Geo. H. Dresser; Division Commercial Superintendent F. C. Daball; and other officials were on the scene and special effort was directed to the establishment of 50 temporary lines for the use of the fire department, police department, physicians, hospitals and newspapers.

The toll cables of the company in Worcester were practically uninjured and a temporary toll station of 12 lines was established in a Main Street store near the exchange building and also one at the latter. Plans were made early in the day for the establishment of temporary local pay stations for toll service in various parts of the city. The main switchboard of the company was little harmed, but it is estimated that nearly 250,000 new connections will have to be made in the distributing room before a normal service can be rendered.

Toll messages for subscribers in Worcester were delivered from the office by messenger boys. As with the Main and Fort Hill exchanges at the Boston headquarters, the Cedar and Park exchanges at Worcester are housed in a single building. Through the efforts of about 150 repairmen, about 10,000 calls were handled on the Cedar exchange board on Sunday, compared with a normal traffic of 150,000 calls.

Telephone Men in A. I. E. E.

The April issue of the Proceedings of the American Institute of Electrical Engineers reports that E. J. Emilio, district engineer, New York Telephone Co., Syracuse, N. Y., has been transferred to the grade of member.

In the same issue the following telephone men are reported to have been elected associates of the institute: R. S. Armstrong, assistant toll manager, Chicago Telephone Co.; Harold H. Brackett, engineering department, New York Telephone Co., New York City; Wm. H. Fenley, superintendent telephones and signals, Panama Railroad, Cristobal, Canal Zone; Fred E. Galbraith, plant department, American Telephone & Telegraph Co., New York City; James O. Jensen, secretary and general manager, Los Gatos Telephone Co., Los Gatos, Cal.; C. J. Larson, chief engineer, Consolidated Telephone Co., Hazleton, Pa.; W. H. Martin, engineering department, American Telephone & Telegraph Co., New York City; Randall Hayner Overocker, engineering assistant, New York Telephone Co., New York City; A. L. Richey, engineering assistant, New York Telephone Co., New York City; Robert S. Ziehn, switchboard repairman, Chicago Telephone Co.; T. L. Dowey, telephone engineer, Western Electric Co., New York City; F. C. Hirdler, superintendent of traffic, Pioneer Telephone & Telegraph Co., Oklahoma City, Okla.; and R. D. Prescott, inspector general, telegraph and telephone, Republic of Panama, Panama.

Municipal Ownership of Telephones in Glasgow.

Frank I. Cohen, formerly Master of Works, of Glasgow, Scotland, has recently been lecturing in New York City on the advantages of municipal ownership. In a letter to the New York Times McAllister Coleman, of New York, calls attention to the fact that "Mr. Cohen neglected to inform his audience that the municipal telephone system of Glasgow was so lamentably a failure that it steadily lost money from its inception in 1901 until 1906, when it was forced to sell to the British postoffice at a loss of more than $58,000. Altogether the taxpayers of Glasgow lost £55,000 by that experiment."

In reply Mr. Cohen wrote to the Times stating that "the telephones in Glasgow were originally owned by a private corportation, and the charges for the use of these telephones were exhorbitant, and the city considered the desirability of inaugurating a telephone system of its own, and thereby reducing the charges for the use of the telephone by half, and after running the telephones for a number of years the city sold out to the British postoffice, which is controlled by our Imperial Parliament. Instead of the telephones in Glasgow being municipalized, they were nationalized with undoubted great success."

Hearing on Safety Code in Wisconsin.

Telephone and other interests were represented at a recent hearing before the Wisconsin Industrial Commission on a proposed code of safety rules for the installation and maintenance of electrical equipment. H. O. Seymour, of Milwaukee, represented the Wisconsin Telephone Co. and J. G. Wray, the Chicago Telephone Co. The contention of the companies was that no stringent regulations ought to be adopted, although they were anxious to have anything done which is really essential to the safety of their workmen. The dangers of improper construction, negligence in maintenance, and incompetent employes were subjects presented. The commission has prepared tentative rules, which will be given another public hearing before final revision and promulgation.

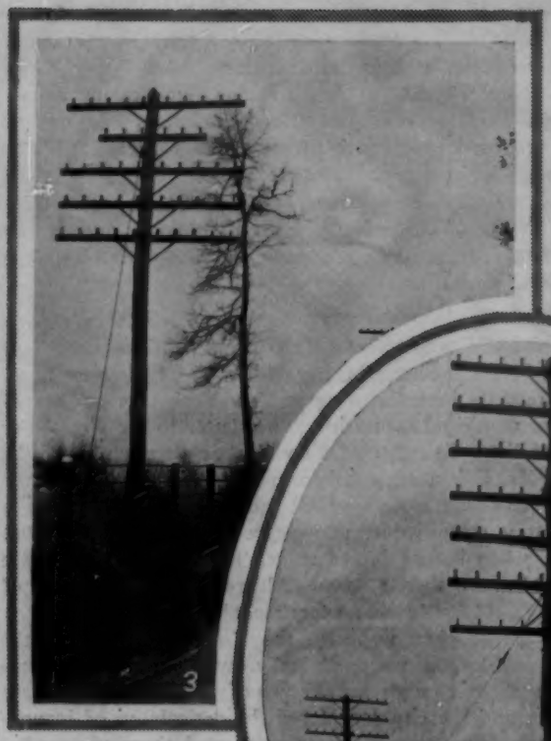
Telephone Growth of Bartlesville.

According to reports made to the general offices of the Pioneer Telephone & Telegraph Co., the office at Bartlesville has made more rapid gains than any other in Oklahoma since the first of the year and now stands fourth in the number of telephones and the amount of business done. Only Oklahoma City, Tulsa, and Muskogee, ranking in the order named, are ahead of it. It has passed McAlester, Guthrie, Shawnee, Enid and Sapulpa, all of which were ahead of it a year ago. Improvements involving a total expenditure of $40,000 are now under way at Bartlesville.

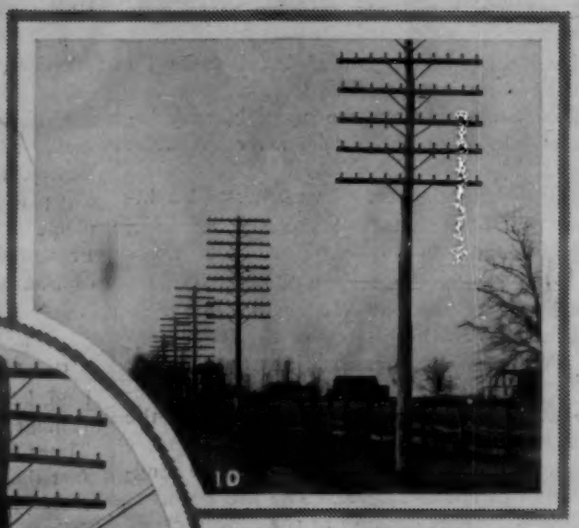
Tri-State Reduces Suburban Rates.

The Tri-State Telephone & Telegraph Co., of St. Paul, Minn., made effective on April 1 a reduction in suburban party line rates from $2.50 to $1.50 per month.

Pole Line Construction Views—Presented for Their Educati



3. Poor—Mixed line of 6- and 10-pin arms, very long spans. The 6-pin arms are being replaced as additional circuits are required.



10. Poor—Showing a too heavy open wire line.

Are You I
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value to those of us wh
The efficiency of any p
head wire plant, is con
workmanship, the constr
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stands out in marked
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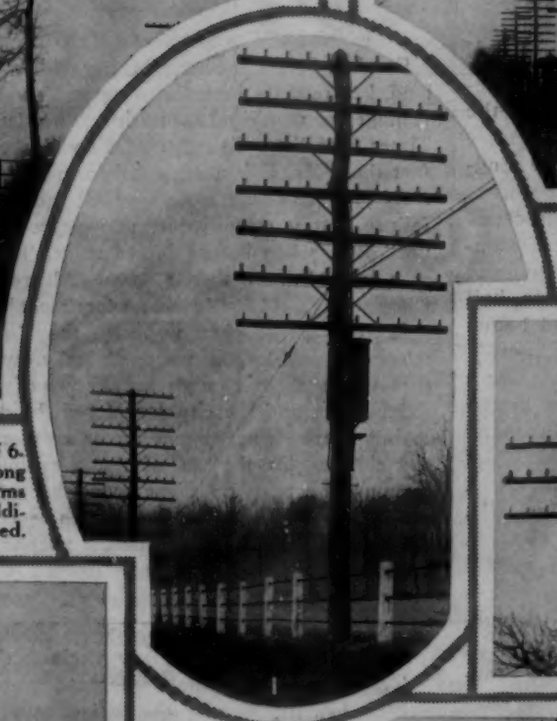
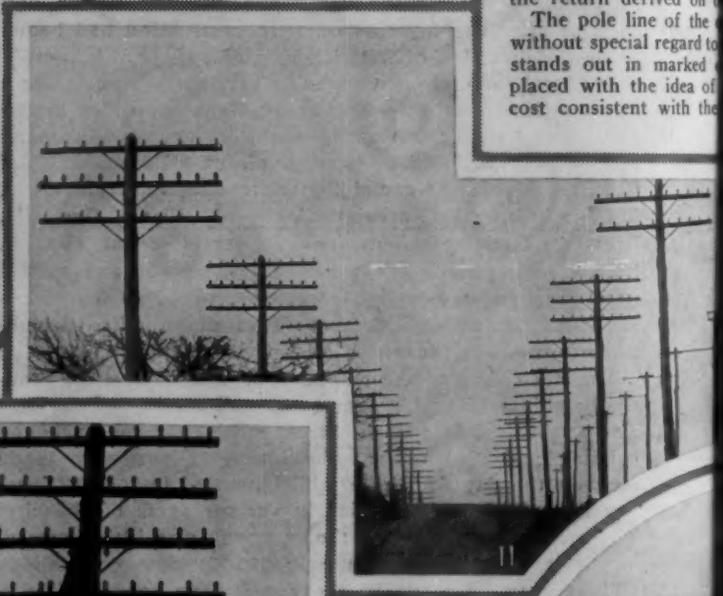
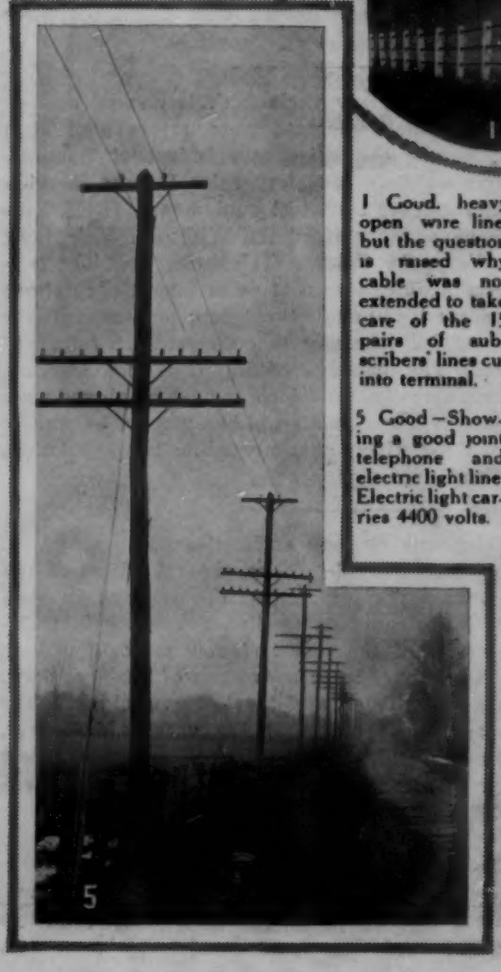


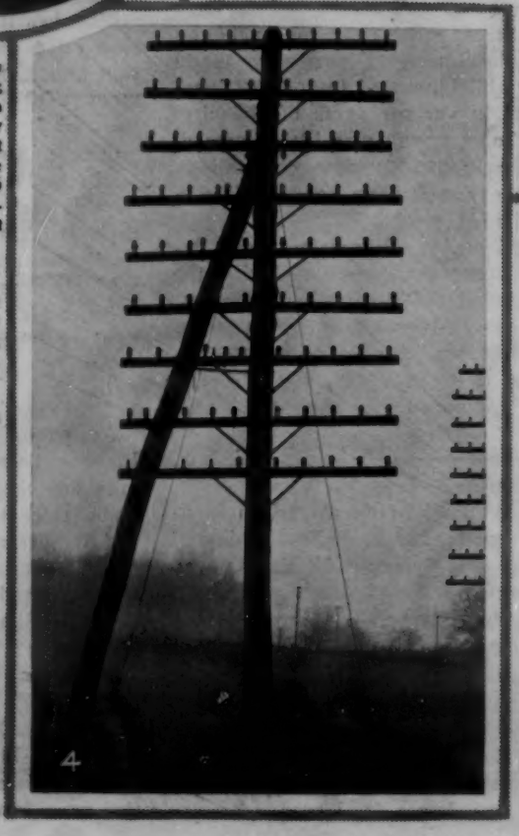
1 Good, heavy open wire line; but the question is raised why cable was not extended to take care of the 15 pairs of subscribers' lines cut into terminal.



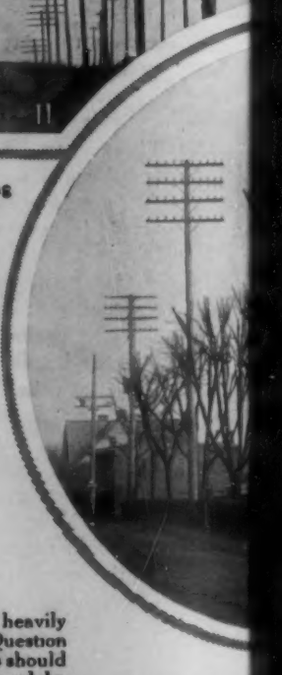
11. Showing twin lines of A. T. & T. Co. and B. T. Co. of Pa. Good.



5 Good—Showing a good joint telephone and electric light line. Electric light carries 4400 volts.



4. Line too heavily loaded Question whether this should not be relieved by a subscriber's cable or a toll entering cable.



9. A good trim will probably b extended from instead of dow

Published Through Courtesy of

VOLUME TIGHTLY BOUND

Value—Do Not Indicate the Best Work of Telephone Men

ed in Pole on?

od and bad examples These are not pre- f the best or of the ggestion may be of rested.

in particular an over- on the planning, the t, the cost of mainte-

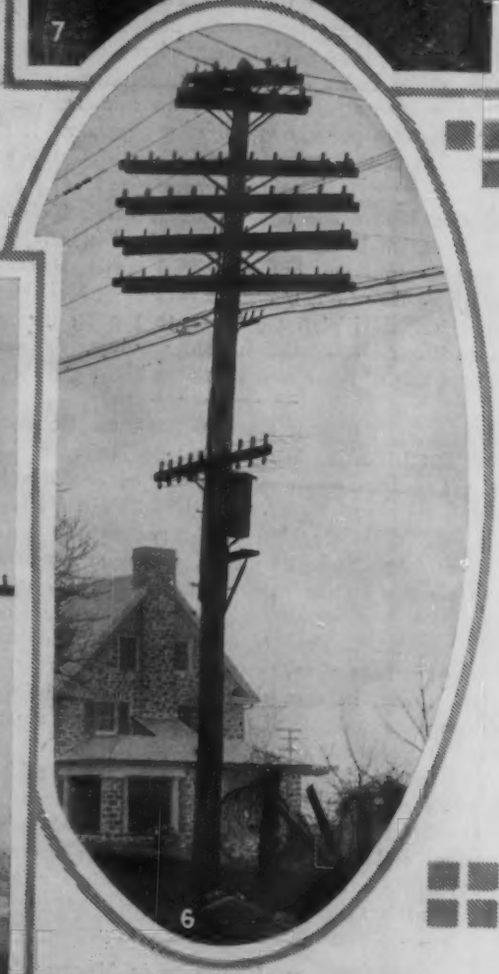
brought to our atten- er good or bad plan- o make the subject of not be justifiable.

le line withstands ex- ible asset or liability, a little forethought in sult in a large saving. pole lines which would n, but the cost of such ld be inconsistent with ment.

phone days, constructed pecification or expense, o modern construction fficiency at the lowest

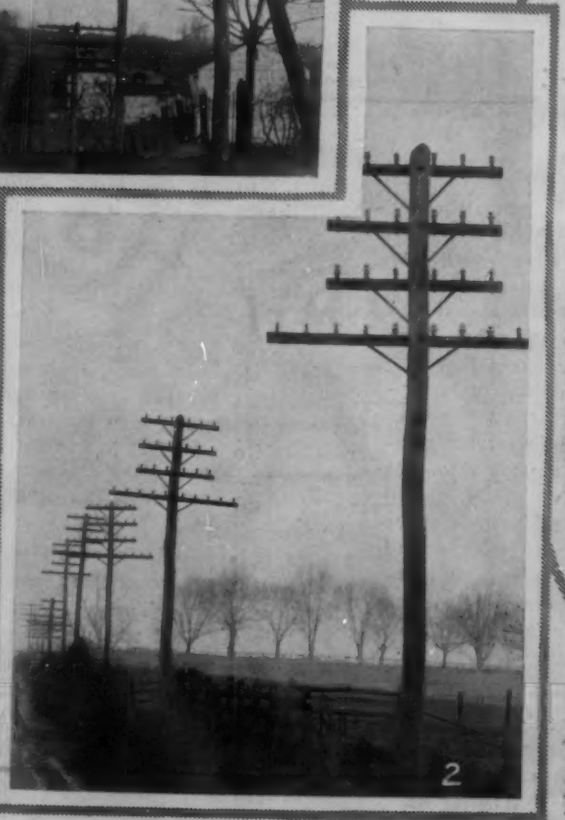
8. Bad tree conditions.

7. Fair—The guys and push-and-pull brace should be attached to about the same point on the pole. The position of the push-and-pull brace is correct.



6. A bad corner and layout. Bonding poorly done. Position of splice is bad, as it throws considerable strain on the marline hangers. No climbing space through wires. This wiring to be replaced with cable.

But the question ty cable was not ear the railroad, ee trimming.



12. Same as No. 11 looking north, showing storm brace poles. Good.

2. Fair—Old toll line built in 1883. The first line between Philadelphia, Media and West Chester. Poorly graded and spaced.

hone News, Philadelphia, Pa.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities and Actions of City Councils Bearing Upon Franchises, Rates and Service

Public Ownership Defeated in Ontario.

The Ontario, Canada, Legislature last week passed an amendment by a Ministerialist member to a motion by a Liberal regretting that the provincial treasurer, Hon. I. B. Lucas, had not submitted a report to the House on the result of his investigations in Great Britain two years ago on the public ownership and operation of telephones, and urging immediate steps to establish such a public-owned and operated service. The resolution was to the effect that the House approve of the report of the provincial treasurer last year that experience in Great Britain justified the conclusion that it was not desirable for the government to duplicate existing lines and enter into competition with the telephone system owned and operated by a corporation over which the province had no jurisdiction.

Mr. Lucas, in the course of the debate, expressed the opinion that it would take $30,000,000 to buy out the Ontario lines of the Bell Telephone Co. of Canada. He deprecated the duplication of plant, with consequent immense economic waste, and years of bitter fighting in the province, and considered that such a plan if carried out would be unfair. J. C. Elliott, mover of the motion, argued, from a careful analysis of the telephone situation in the provinces of Canada, that many advantages would come through the provincial ownership of toll lines. Under proper administration the cost of the service would be greatly lessened, and the benefit of the telephone extended to almost every home in the province. However, the majority of the members voted for the amendment, thus expressing their view that public ownership of telephones is not desirable in Ontario at the present time.

Ontario Hydro-Electric Commissioner's Telephone Plan.

Hon. Adam Rech, chairman of the Ontario Hydro-Electric Power Commission, has suggested the desirability of giving the Hydro-Electric commission control of local rural telephone companies. His plan would be to put all the wires on the Hydro-Electric construction, thus removing the sometimes two or three sets of poles seen along the highways.

Vermont Case to Supreme Court.

Justice John H. Watson of the supreme court of Vermont has signed the application of the Franklin County Telephone company and the Champlain Valley Telephone company for suspension of the recent rate order issued by the Vermont Public Service Commission pending appeal and determination of the rate matter by the supreme court. The application was unopposed by the state except that the state asked that the order should be conditional on repayment of excess charges paid by subscribers from the date of the order, in case the order of the public service commission is sustained, and the petition was amended to that effect and signed.

The suspension of the order is a matter of form in order to allow the supreme court to pass on the question raised at the May term. The order of the public service commission making certain reductions in certain telephone rates of these companies was to become effective 30 days from March 14.

Tax on Valuation in Vermont.

The Vermont board of appeals in the telephone tax valuation cases, composed of Lieutenant-Governor Howe, Secretary of State Bailey and State Auditor Graham, has fixed valuations slightly lower than those of Tax Commissioner Plumley's appraisal, but the changes principally affect the smaller companies save for a reduction of the appraisal of the New England company. The changes in the appraisal of the smaller companies result in a net reduction of $50,300, but of this sum almost one-half was by agreement of the attorneys for the state after a hearing at Montpelier. The appraisal of the New England company is fixed at $1,850,000, while the value was placed by the tax commissioner at $2,025,000. The four New England subsidiaries, the Franklin county, and the Champlain valley, the Passumpsic and the Vermont companies, are not greatly changed from the figures given by the tax commissioner, except the Franklin County company, which is reduced from $110,000 to $96,000.

After looking up authorities, the board of appeals held that the appraisal for purposes of taxation was not on the same basis as an appraisal for rate making and therefore did not take into consideration the value placed on the property of the New England and its subsidiaries by the public service commission following the three months' hearing which recently closed, and as a result of which the public service commission ordered a reduction of rates on multi-party and farmers' lines.

As a result of the appraisal and the new basis of taxation fixed by the legislature of 1912, the telephone companies of the state will pay more than double the taxes that they have previously paid. The old basis of taxation was on gross earnings, while the new system calls for a tax of $12.50 per thousand on the value of the property.

There are 88 telephone companies in the state and the state took an appeal in every case, while a considerable number of the companies also appealed.

Accounting Systems of Interstate Commerce Commission.

Since January 1, 1913, the Interstate Commerce Commission has required all telephone companies having annual receipts of over $50,000 to keep a prescribed system of accounts. Before the larger companies were instructed to keep these accounts, it was announced that all telephone companies, regardless of size, would have to begin keeping these accounts at that time. This order was afterward modified and only the larger companies were required to install the system.

The Interstate Commerce Commission has been preparing and is about ready to issue instructions for a system of accounts for the smaller companies. These companies have been divided into two classes: Those having annual receipts from $10,000 to $50,000; and those having less than $10,000 annual receipts. These two classes are to be known as "C" and "D". For the "C" class, a system of accounts is proposed which is simpler than that for the larger companies but enough in detail to enable the commission to secure from the companies keeping accounts, reports as to all transactions. The smallest companies, the "D" class, are to be required to keep only a cash book record showing receipts and disbursements.

There are about 250 companies which are now keeping the accounts under the order which went into effect January 1, 1913. There are about 1,000 class "C" companies and 10,000 or more in the "D" class. These smaller companies will look forward with interest to receiving the pre-

liminary instructions in regard to the keeping of these accounts, especially as the system may in some states vary from the system required by the state commission. It is understood to be the desire of the Interstate Commerce Commission that eventually all the state commissions shall conform to the interstate form, or rather that a standard form shall be agreed upon which will be established both by the Interstate and state commissions, thus doing away with the necessity of keeping duplicate accounts by the smaller companies.

The experience of those companies which have been keeping the accounts, required by the state commissions, is that the system is of great benefit to the companies in that it has enabled them to learn more about their own business and to know exactly what their condition is. For this reason, while probably many of the smaller companies will object to the new order, in the end it is almost certain they will all agree that the keeping of some such system of accounts is of great benefit to the individual company.

It is not likely that the new system of accounts will be promulgated before July 1, as the system is now being scrutinized by the state commission accountants and suggestions are being made for such modification as may seem necessary.

Rate Investigation by Georgia Commission.

Exhaustive testimony has been taken by the Railroad Commission of Georgia in the case of the city of Columbus against the Southern Bell Telephone & Telegraph Co.

In 1908 the latter company bought out the Columbus Automatic Telephone Co., and under an agreement with the city but one telephone franchise was to be granted. The Southern Bell Telephone & Telegraph Co., was to be allowed to charge $5 for business and $2.75 for residence telephones when the number of subscribers reached 2,500. A total of 2,802 stations was secured some months ago and the company endeavored to raise the rates according to the agreement. The city of Columbus objected and appealed to the railroad commission. The commission permitted the increase subject to a thorough investigation of conditions.

Hearing as to Telephone Meters in Massachusetts.

A bill to require telephone companies in Massachusetts to install meters free of charge on measured service telephones was the subject of consideration at a recent hearing in Boston before the committee on mercantile affairs of the Massachusetts legislature. The bill is that of Representative W. N. Cronin, who declares that a telephone company should be required to provide meters the same as concerns supplying taxicabs, gas, water and electric service. The claim was made by one speaker at the hearing that the New England Telephone & Telegraph Co. has collected $1,000,000 in the past three years, in excess of what it should have, by reason of doubtful excess calls. It is stated that the telephone company objects to putting in the telephone meters except at the charge of $3 now in effect.

Settlement of Bell Anti-Trust Suit in Mississippi.

An agreement was recently reached between the American Telephone & Telegraph Co. and the state of Mississippi by which the company will pay the state $50,000 in penalties in settlement of the suit started by the state about a year ago against the Western Union Telegraph Co., the Cumberland Telephone & Telegraph Co., and the American Telephone & Telegraph Co. for $16,000,000 for alleged infractions of its anti-trust laws.

The fundamental contentions of the state were based upon the ownership of Western Union stock by the American Telephone & Telegraph Co., and the agreement between that company and the attorney general for a disposition of that stock paved the way for an adjustment.

No objection was made either to the organization of the Bell system or to the relation of the companies to each other, and their transaction of the telephone business in Mississippi is not criticized. The legislature of Mississippi passed a resolution authorizing Attorney General Collins to compromise the suit on the foregoing basis.

Massachusetts Governor Would Change Commissions.

Governor Walsh of Massachusetts advocates the reduction of the Public Service Commission from five to three members, with salaries of $8,000 each, and the enlargement of the functions of the Gas and Electric Light Commissioners so as to include supervision of telegraph and telephone, water supply and water power companies, members of this board to have a salary of $8,000 each.

Number of Subscribers on Wisconsin Lines.

Some of the rural telephone companies of Wisconsin are writing letters to the Wisconsin Railroad Commission protesting against the proposed adoption of a rule prohibiting more than 12 subscribers on any single rural line. Some of the companies say they have as many as 20 subscribers on some lines and that the latter are objecting to being placed on lines with 12 or fewer subscribers. The commission is considering the advisability of making a special rule for rural companies allowing 20 subscribers on a line, or suspending the proposed rule, if it is adopted, upon request of any small company showing that its subscribers want more than 12 subscribers on a line. The matter will probably not be decided by the commission for several weeks.

Reduced Rates for Denver; Court Signs Ouster.

The Moutain States Telephone & Telegraph Co. recently announced that it stood ready to make a reduction in rates in Denver and would adopt the schedule proposed by the Denver Business Men's Association, which provides for a reduction of 25 to 30 per cent. The new rates, agreed to as applicable from April 1, are as follows:

Business Telephones.

Unlimited	$8.00
Measured, one party line, 150 calls Excess calls, 1½c.	4.00
Measured, two-party line, 75 calls Excess calls 2c.	3.00
Two-party nickel-in-the-slot service, with a rebate of 1 cent for each call over and above the guarantee of $3	3.00
One-party, guarantee, rebate of 2 cents over and above the guarantee	4.50
Extension telephones	.50

Residence Telephones.

Unlimited, one-party line	$3.00
Unlimited, two-party line	2.50
Measured, one-party line, 60 calls Excess calls 2c.	2.00
Measured, two-party line, 40 calls Excess calls 3c.	1.50
Measured, six-party, guarantee of 4 cents a day and 5 cents a call	1.20
Extension telephones	.25

Under the arrangement the company is to pay to the city 2 per cent of its gross revenue each year, and will be required to install telephones free, recognize the right of the patron having measured service to have a meter if desired, and relinquish all claim to the $25,000 heretofore paid into the city treasury under an ordinance passed several years ago, but not enforced. Many other minor demands of the business men will be acceded to.

On the day following the company's announcement, Judge John H. Dennison, of the district court, after list-

ening to lengthy arguments in the case against the Mountain States Telephone & Telegraph Co., signed the writ of ouster prayed for by the district attorney. The action was taken over the protests of Attorneys C. R. Brock for the telegraph company and James Brown for the Business Men's Association. The company was given 30 days' stay of execution, but was required to remove its poles and other property from the streets of Denver in 90 days. The company's appeal to the supreme court will, however, act as a further stay until the application for a writ of supersedeas can be heard.

Proposed Maryland Bill Modified.

The Telephone Protective Association of Baltimore, which originated a bill that was introduced in the Maryland general assembly recently, decided to eliminate the clause prohibiting the Maryland Public Service Commission from capitalizing easements of public utility companies in fixing rates. Another change in the bill affects that clause which provided that the commission shall allow a public service corporation to earn an amount equal to the legal rate of interest, except in special cases which must be cited by the commission. The amendment provides that the commission shall state its reasons for allowing a corporation to earn whatever amount is decided upon by the commission. The final section of the bill allows the commission broad powers in fixing schedules of telephone service desired by the public.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

March 18: Complaint filed by R. L. Swanson, owner of a telephone system in Tehama and Shasta counties, alleging that the Pacific Telephone & Telegraph Co. had violated the public utilities act by rate discrimination, installation of service in new territory and by certain constructon work in Tehama County.

March 30: Decision granting the Coley-Craig company permission to sell its plant and exchanges at Riverbank and Escalon to the Pacific Telephone & Telegraph Co. for $1,300.

April 1: Decision authorizing the Sunset Telephone & Telegraph Co. to sell its system at Tulare, Tulare County, to the Tulare Home Telephone & Telegraph Co.

IDAHO.

April 15: Hearing at Soda Springs on petition of the Gem Valley Telephone Co. for a certificate of public necessity for a telephone system in the Gem Valley, formerly Gentile Valley, in Bannock County.

April 15: Hearing at Soda Springs in the case of the Smith Telephone Co.

ILLINOIS.

April: Decision granting application of the Mt. Auburn Telephone Co., of Mt. Auburn, Ill., to adopt a schedule of higher rates.

April: General order declaring illegal any advance in rates over those effective on July 1, 1913, unless the advance has been approved by the commission.

INDIANA.

April: Petition by the Martinsville Telephone Co., Martinsville, Ind., signifying its willingness to operate under an intermediate permit as provided for by the law.

April: Petition by the Peoples Mutual Telephone Co., of Wolcottville, Ind., to compel the Bell company to give it toll connections.

KANSAS.

March 31: Permission granted the United States Telephone Co. of Abilene to take over the Phillipsburg and Kirwin exchanges of the Empire Telephone Co. for $36,000.

MICHIGAN.

March: Order authorizing the Croswell Telephone Co. to issue $25,000 capital stock. The new company is taking over the Fremont Farmers Telephone Co., of Sanilac County.

May: Hearing on application of Michigan State Telephone Co. for metered service in Detroit.

NEBRASKA.

March 23: Order authorizing the Lincoln Telephone & Telegraph Co. to charge 50 cents additional for business telephones on farm lines.

April: Hearing on application of the Lincoln Telephone Co. for authority to increase rates in York County.

April: Order permitting the Nebraska Telephone Co. to issue $4,000,000 worth of two year notes to take up floating indebtedness.

OHIO.

March 20: Application by Cincinnati & Suburban Bell Telephone Co. for permission to issue $637,150 of stock, consisting of 12,745 shares at par value of $50 each, the proceeds to be used for improvements.

OKLAHOMA.

April 15: Hearing for receiving objections to the proposed adoption by the Corporation Commission of Oklahoma of the uniform system of accounts for telephone companies prescribed by the Interstate Commerce Commission, and instructions relating to operating expense accounts.

PENNSYLVANIA.

March 26: Hearing held at Philadelphia by Commissioners Pennypacker and Johnson on the complaint of James B. Bonner, of Melrose, in regard to alleged discriminations in rates to Melrose and Oak Lane subscribers of the Bell Telephone Co., of Pennsylvania. Counsel for the complainants were given five days to file briefs, to be followed within five days by briefs from the telephone company.

TENNESSEE.

April: A general investigation of rates for telephone service and for long distance tolls charged by the Cumberland Telephone & Telegraph Co. in Tennessee.

WISCONSIN.

April 2: Application by Hammel Telephone Co. for a writ of convenience and necessity to build a plant and install a telephone system in the town of Hammel, Taylor county, and connecting with the main lines at Medford. Hearing on the petition will be held at Medford.

April 2: Refusal of the application of the West Kewaunee & Western Telephone Co. for permission to extend its lines in the towns of West Kewaunee and Mt. Pelier in Kewaunee county. Objection to the extension was made by the Horseshoe Telephone Co., which operates in the same territory.

April 1: Hearing held on application of the Mosinee Telephone Co. for authority to increase rates.

April 3: Hearings held at Walworth in matter of investigation, on motion of the commission, of the alleged refusal and neglect of the Walworth Telephone Co. to install telephone service for L. P. Coventry, Fontana, and in the residences of Fred Nash, James Cunningham and Adolph Utesch, of Walworth township.

April 3: Hearing held at New Richmond on application of the St. Croix Telephone Co. for authority to increase rates.

April 6: Hearing held at Madison on the application of the Ripon United Telephone Co. for authority to increase rates.

April 7: Hearing held on the application of the Adams County Metallic Telephone Co. for authority to increase rates.

April 9: Hearing held at Madison in the case of George B. Skogmo vs. the Pierce County Telephone Co. and the Wisconsin Telephone Co.

April 9: Hearing held at Madison in the case of Frank Posphical, et al. vs. Muscoda Telephone Co.

April 11: Hearing at Madison in the investigation, on motion of the commission, of the rates, service and management of the Eleva Farmers' Telephone Co., of Eleva, Wis.

April 13: Hearing in case of the Belmont & Pleasant View Telephone Co. vs. the Lafayette County Telephone Co.

April 14: Hearing at Madison in the case of the Interurban Telephone Co. vs. the T. M. R. R. & L. Co.

April 15: Hearing at Madison in the investigation, on motion of the commission, of the alleged violation of Ch. 610 of the laws of 1913 by the Lisbon Telephone Co.

April 16: Hearing at Madison in the case of the Arena & Ridgeway Telephone Co. vs. the Troy & Honey Creek Telephone Co., the Spring Green & Wyoming Telephone Co., the West Spring Green Line and the Big Hollow Telephone Co.

April 16: Hearing at Madison in the case of the Arena & Ridgeway Telephone Co. vs. the Mazomanie Telephone Co.

April 17: Hearing at Madison in the case of D. M. Rowlands, et al. vs. the Cambria Co-Operative Telephone Co. and the People's Telephone Co.

April 21: Hearing on the application of the Ettrick Telephone Co. for authority to raise rates.

April 21: Hearing at Madison on application of the West Menasha Telephone Co. for authority to increase rates.

April 21: Hearing at Madison in the case of J. A. Kestel et al. vs. the Marshfield Rural Telephone Co. and the Stratford Telephone Co.

Practical Subjects—Letters and Discussions

Universal Toll Line Connections.

By Garrison Babcock.

A telephone plant, the construction of which has been engineered with a view to "relieving waiting lists" and the supply of satisfactory local service for the past ten years, is very likely confronted with new problems, when its directors consider the undertaking of a contract for interconnection with "universal long distance" lines.

Commercial telephone service of a local character may be rendered in single exchange plants with any of the standard types of common battery instruments and switchboards through subscriber line circuits having a maximum of 1,000 ohms loop resistance and free from leakage. However, multi-exchange plants require reductions of this limit and, in some plants, the maximum is placed at 350 ohms and the inter-exchange trunks are provided through cables having greater conductivity for voice currents than that used for subscribers' lines.

Switchboard circuits, wiring, cords and surrounding conditions, all enter into the loss factor problem, as well as the substation wiring and the apparatus thereat maintained.

In territories where there is no competition, the question of commercial service, either local or long distance, is one which holds or antagonizes public good will, but where there are dual systems and competition, the commercial service factor enters both in the courtesy of employes involved in the traffic, and the character of speech transmission rendered.

The efficiency of service between two subscribers of a local connection may be satisfactory even where the maximum line conditions are involved, but when those conditions are coupled with a toll trunk extending to the long distance terminals, through a toll line and another set of repeating circuits and into the distant local exchange under similar maximum subscribers' line conditions, the question of commercial service may be a very vital one if the opposition would attribute all causes of difficulty to the plant originating the call.

The necessity of duplicate supervision and checking is one which, in itself, interjects voice current loss factors which might render otherwise commercial service absolutely unacceptable to subscribers who have two services to draw from. In other words, the plant which must work under the handicap of double checking supervision may find that, in order to keep subscribers who use long distance service, their local plant equipment must be maintained to a higher degree of talking efficiency than the one where the toll line service is not double checked.

The importance of the engineering involved in the specification of the standard toll trunk connecting local to long distance to omit all possible loss factors must be recognized and conducted with regard to the traffic rules, or rather the method of operation, and engineering must be conducted with mutual consideration.

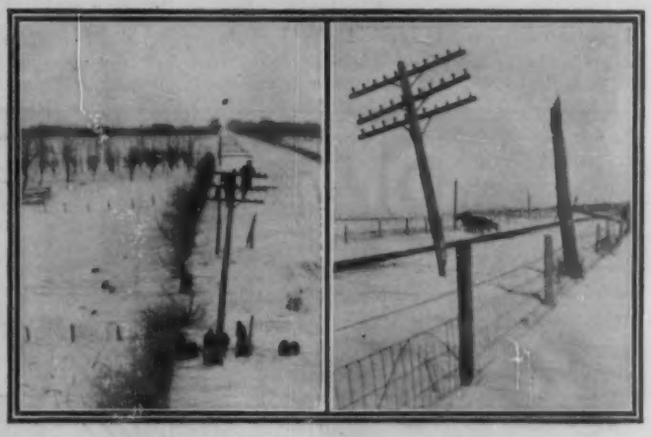
A Troubleman's Experience in Nebraska.

The accompanying photographs were taken the latter part of February, after a sleet storm and 48-hour blow. In the first photograph the break of 16 poles, was not stopped by the storm guys at either end, the end poles breaking in the middle. The pole behind the one in the foreground broke in the middle and turned over, twisting all the wire of the lead together. It probably broke first as it was full of woodpecker holes. In this lead were six copper circuits besides the two A. T. & T. Omaha-Denver lines. In repairing the break which was located near Bradshaw, Neb., 20,000 feet of twisted pair wire was used.

The other photograph shows an eight-pole break near York.

I have been shooting trouble for some six years and it seems that there is always some new way for a line to get itself into trouble. Last summer, for instance, was the first time I had ever found a copper toll line shot and broken by a hunter—in fact, the bird, if he got it, cost the telephone company something like $6.

Another peculiar case was a grounded farm line on which the trouble was found to be caused by the paper on the wall



Toll Leads in Nebraska After February Storm.

behind a protector. In hanging the paper, metal was brushed off the fancy border, lodged in the carbons and grounded the line. Funny? Maybe, after your motorcycle has run through a barbed wire fence while you were watching the line for a ground.

Wasps may not be an important factor in the telephone business, but when you raise the lid on a cable can, which they are using for summer quarters, it does not take long to make up your mind that there is a small Mexican war turned loose.

Not so very long ago one of the boys cleared a short on a common battery farm line, locating it in the hook switch at a substation. When he got back to town, the wire chief asked him how he knew it was in that particular set. His answer was that he had tested the subscriber's loop with his receiver. It is a simple matter to test common battery lines with a receiver, and yet a good many plant men call the test board when they might locate either a short or ground with their test set. Suppose the line has a short in the spur indicated in the sketch. Snap the receiver across the line between the junction and the office and open one side at point *P*. A sharp click will be heard in the receiver.

Grounds may be located in a similar manner. If the ground is on the live side of the line, it may be located by opening the various lines until the receiver pops. The last wire removed is grounded. If the ground is on the opposite side of the line, open the wire, snap the receiver on the live side of the line toward the office and feel of the other wires. The one that makes the receiver pop is grounded.

I was interested some time ago in an article by J. A. Kick where the wire chief sends a troubleman to a distant town and then directs him to a certain pole where he is to find some case of trouble. That sounds nice, theoretically, and it would save us troublemen some wild-goose chases if all wire chiefs would locate their trouble so closely. An experience I had locating a swinging ground on the much talked of New York-Denver circuit, does not convince me that J. A. Kick was wire chief at Omaha at the time.

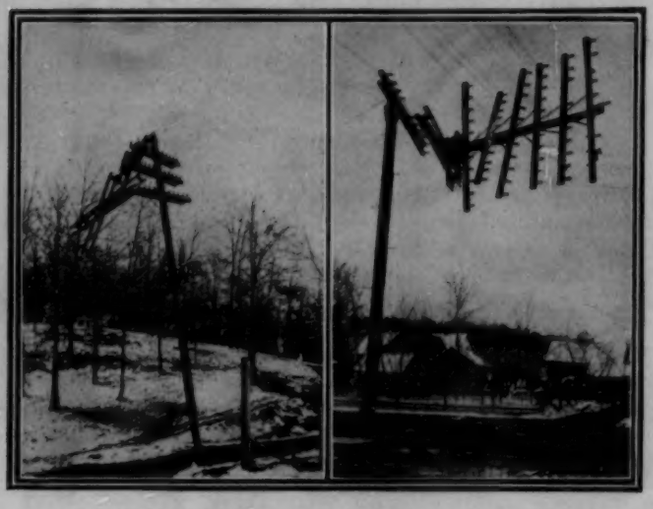
The first day I was after this ground, they told me I would find it about two poles west of the junction at B. Just to be

certain that I had gone far enough, I rode six miles farther and then came home. A week or so later I was in A when the testman said that Omaha wanted me. I called and Omaha said I would find the ground about two miles east of A, some 12 miles west of his first guess. I went after it and got it about six miles east of A. I afterward learned that a man had been sent four miles west of A on the same trouble. Close guessing on the part of some wire chief.

York, Neb. Rufus Comstock.

A Cold Reception for New Man.

I am enclosing some photographs showing the cold reception I received when I arrived in this place the latter part of March, to rebuild and cut over the town. I found that a



In Arkansas a March Snow Caused Trouble.

heavy snow had broken down three large junction poles and about 15 other poles, each having five arms.

Harrison, Ark. Thomas W. Wilkinson.

The Farmers Mutual Company Question.

It is said that every man wants to write a book at some time in his life. I do not want to do that, but I feel like writing a piece of my mind at the shabby trick that was played on me by a brother (?) manager of an Independent telephone exchange.

My rates for the past five years since owning this exchange have been; business $1.50, residence 75 cents and $2 per year for farmer telephones, the farmers owning their lines.

My gross receipts have been around $1,500 and as everything has been advancing in price so rapidly the past few years, and also having a demand for more and better service, I decided to advance rates the first of January this year to $2, $1 and $3 respectively for the different classes of service. Of course, as we had expected, this action created a fearful opposition. The farmers had meeting after meeting, some of them attended by over 100 men coming in automobiles to protest at the raise of $1 per year, and they spent enough time and money to pay the advance for the next ten years.

The outcome of it was that they requested me to operate at the old rates until the first of June in order to give them a chance to investigate the telephone business to see if it would be advisable to buy me out, freeze me out, or pay my demands.

A committee was appointed but about all it did was to apply to a company operating a number of exchanges in this part of the state to see if they would extend their toll lines here and also provide an outlet if the farmers decided to build an exchange of their own. The manager of a neighboring exchange of this company met with this committee one day recently and, while he did not give any encouragement as to building here, so far as his company was concerned, he told the committee that "I had a good thing, and was not justified in asking the raise;" "Wished he owned the exchange;" took my directory and figured out how I had about 25 more telephones than I really have; made out that I earned much more than I am willing to swear to when I make my report to the state treasurer and in other ways put me in bad with the farmers and made them more chesty than ever in their opposition.

The committee had not investigated other exchanges in the least and did not know what it cost to operate, but were sure they could do it for what I am now getting or less. A committee was appointed to get prices on a farmers' board and another to ask for bids to handle the nine lines coming into my exchange, at a price not to exceed $2 per year. As there are 210 farmers on these lines, one can see the enormous amount of money some one is going to make, if they take up the proposition. The farmers say they do not want to go into the telephone business but that if the town does not want to have them in the exchange at a reasonable rate, they will have their own exchange and the town can go to the eternal bow wows. They would not consider for a moment of buying me out at an appraised price set by telephone men, but want to make me do their work at their price or they come in and destroy my business. It is surely fine business owning an exchange in a small village without a commission to protect one's interest.

Will just say that the committee was unanimous in praise of the service they get, but just knew that I did not need the raise. A Western Manager.

Safety First.

Telephone men ought to be vitally interested in the discussion that is prevailing all over the country at the present time, namely, "Safety First," and it would seem that efforts should be made to bring the telephone prominently before the public at this time. There is a great field for telephones in and about machinery, as well as in other places, which could be used in case of accidents.

At the present time when an accident takes place, it takes several valuable minutes to stop the machinery or get to the office to call a doctor, which could be saved by a proper use of telephones; and the cost of such telephones privately installed would be comparatively small. In addition, the telephones are capable of filling other desirable features in the factory management.

Washington, D. C. A. P. Connor.

Raising Funds for Extensions.

In the March 21 issue of TELEPHONY, page 30, the plan of the Rochester (N. Y.) Telephone Co. for raising funds was described. Letters were sent to holders of the general mortgage bonds asking their assent to the plan, which provides for the issuance of bonds in exchange for the interest coupons from the general mortgage bonds for the next two years. So many of the bondholders signified their approval of the plan that the time limit for sending in approvals has been extended, as explained in the following letter under date of April 3:

To the general mortgage bondholders of the Rochester Telephone Co.:

So much progress has been made towards the accomplishment of the plan outlined in our letter of March 5th last, that the directors of your company, with practical unanimity, deem it advisable to at least defer the payment of the coupons which became payable on April 1st, instant, and to make a further effort to convince you that it is to

your own interests that that plan shall become effective. Holders of more than $700,000 of the general mortgage bonds have already expressed their approval. There are $972,300 outstanding, $875,000 are, therefore, required to make the plan effective.

The plan is so obviously to your own interests and advantage that it seems as though it could not have been clearly understood. We, therefore, repeat the essential part of it: It is: That the coupons on the general mortgage bonds covering a period of two years, beginning with those which became due on April 1st, instant, be clipped and surrendered; that new bonds of the same issue of the exact amount of the clipped coupons be issued to you at once with the coupons for the same two years clipped therefrom.

You thus will simply exchange two years' coupons for new bonds of the same amount. The face value of the coupons for the two years is about $100,000. *You do not lose that sum; instead, it goes into the company's plant for extensions and additions and you will receive new bonds for the whole of it.* At the same time, the surplus net earnings of the company, during the same period, which will not be less than $100,000 more, will be added to the plant. Thus, $100,000 of new bonds, representing the amount of the clipped coupons, will be issued against $200,000 of additions to the company's plant, and the company's financial condition will thereby be very materially strengthened.

Furthermore, a public service corporation, as we pointed out in the letter of March 5th, must have, in order that its service may expand to keep pace with the expansion of the city in which it operates, occasional additions to its capital investment. Such additions can never come wholly from the earnings of such a corporation. The company's system is constantly growing. Its only difficulty is that its funds are inadequate to permit it to grow with the necessary rapidity. If it cannot obtain such funds, then with the strong competition with which it has to contend, the time is sure to come when it will begin to decline.

The company now has a waiting list of over 400 applications for its service. It cannot serve them without making considerable extensions and additions to its system. It cannot make those additions and extensions without money. It is your interests, and your interests only, that your directors are seeking to conserve. The plan which we have submitted is one, the burden of which upon you is extremely light. You lose nothing but a trifling amount of interest upon interest, and you gain a very decided strengthening of the entire situation.

The directors of your company, for the reasons here stated and for the reasons stated in the previous letter, are so firmly and thoroughly convinced that the plan which they have submitted to you is for your own benefit and advantage that they have determined not to pay the interest coupons which became due on the first instant, at present, and to make one further effort to bring about the ratification of the plan proposed. The payment of those coupons was, therefore, postponed to June 1st. Whether they will be paid then, will have to be then determined.

If you have not already approved, we again urge you to do so by signing and returning the enclosed card, without delay. If you have already expressed your approval, please sign and return the card, nevertheless, so that we may have your consent to the extension to June 1st of the time for receiving consents.

By order of the board of directors.

George R. Fuller, President.

Get Together Meeting at Waverly, Ohio.

At the "instigation" of President E. Humphrey, of the Pike County Home Telephone Co., and the Adams County Home Telephone Co., of Waverly, Ohio, about 50 representatives and managers of Independent telephone companies in Ohio held a recent get-together meeting at Waverly to discuss questions that arise in dealing with the toll companies and with the local mutual companies. E. H. Hanna and Geo. E. Cannon were present on behalf of the Ohio Public Utilities Commission, and spoke regarding the work of the commission in connection with the relation between the telephone companies and the public.

H. C. Stevens, of Columbus, general manager of the United States Telephone Company for Ohio, spoke interestingly, as did H. C. Bouch, manager of the long distance line of the same company for Columbus. They were followed by Scott McKell, manager of the Chillicothe district; B. Woodbury, special representative of the Kellogg Switchboard & Supply Co.; W. B. Shank,, manager of the company at Washington C. H.; "Doc" C. L. Jones, head of the telephone business at Athens; and J. McDowell, manager of the Ironton system. Judge Folsom of Circleville, an old timer in the telephone business, acted as toastmaster at the banquet tendered Mr. Humphrey's guests and made a model one for the occasion. He and Mr. Humphrey have both had years of experience in this line of work and their remarks on various questions were especially well received. The following, among others, were the guests of Mr. Humphrey:

H. M. Allen, Portsmouth; R. B. Reeser, Cincinnati; James E. Judd, Toledo; C. F. Weaver, Portsmouth; Edwin Myers, Genoa, Ill.; V. G. Eastman, Columbus; Oscar Avery, Columbus; Charles Sulceberger, Greenfield; Earl S. Campbell, Columbus; B. Woodbury, Columbus; E. W. Lutz, Circleville; Geo. E. Cannon, Columbus; E. H. Hanna, Columbus; H. P. Folsom, Circleville; W. B. Shank, Wash. C. H.; Rollo R. Stevens, Columbus; Scott McKell, Chillicothe; J. C. Boush, Columbus; J. McDowell, Ironton; H. M. Elliott, Chillicothe; J. D. Love, Wash. C. H.; C. L. Jones, Athens; F. E. Dougherty, W. F. Taylor, Ernest Schuskey, Carl L. Johnson, W. D. Dougherty, John Smokey, Samuel Tatman, and Ernest J. Humphrey of Waverly; John R. Humphrey, Omega; Harley Nase, Piketon; Charles E. Condon, West Union and A. J. White of Chillicothe.

For the entertainment of his guests, says a local newspaper, Mr. Humphrey had one of the rooms of his "central" home most elegantly decorated and here was served an elaborate dinner in several courses. Caterer L. H. Davis, ably assisted by several "central" girls and C. E. Condon, manager of the company's affairs at Manchester, made the banquet end of the program move in elegant shape. The long table was beautifully decorated with carnations, the gift of the office girls to Mr. Humphrey for his party. Several local citizens were present.

Repairing the Lines in Ohio.

The accompanying picture shows one of the five gangs we had repairing damage after the January sleet storm. The Greenville Home Telephone Co. had a very heavy loss from the sleet storm that hit Ohio and Indiana in January. Out of the Greenville exchange they had about 30 miles

One of the Line Repair Gangs.

of toll pole line leads go down from the heavy weight, ranging from one arm to five arms of wire in the country.

In the city they had three of their heaviest city leads go down.

The picture is of the gang which repaired the 6½ mile break on the Greenville-Richmond lead.

Greenville, Ohio. Geo. Murphy.

Annual Reports and Meetings of Telephone Companies

Statements Given Out by Telephone Companies in Various Parts of the Country Relative to Their Operations During the Past Year—Summaries of Earnings and Expenses—Growth in Number of Subscribers and Equipment—Provisions for Future Development

Annual Report of Cuyahoga Telephone Co.

The annual report of the Cuyahoga Telephone Co., of Cleveland, Ohio, for the year ending December 31, 1913 shows a decrease in gross income of $21,310 and a decrease of $15,372 in net income as compared with 1912. In a statement to the company's stockholders, President Chas. A. Otis says that the decrease in toll earnings as shown by the statement was caused by the flood conditions in March and the severe storm in November, at which time the company was wholly without toll service for several days, and only a limited service was given for several weeks. The increase in expenses was due to the salary increase of women employes, caused, in large measure, by the Women's Labor Law, which made necessary an entire reorganization of the force. Increased taxes amounted to $6,919. The statements of the company, cents omitted, follow:

INCOME.

	1913	1912	Increase *Decrease
Rentals, telephone	$779,383	$766,655	$ 12,728
Toll service, long distance	9,642	12,462	*2,820
Toll service, suburban	6,340	6,685	*345
Toll, service, pay stations	69,989	65,061	*72
Rentals, electric building	63,902	75,850	*11,948
Miscellaneous	15,565	13,001	2,564
Total income	$939,821	$939,714	$ 107

EXPENSES.

Maintenance	$150,823	$145,923	$ 4,900
Depreciation	147,498	149,712	*2,214
Traffic	145,183	130,808	14,375
General, commercial and miscellaneous	113,792	113,095	697
Uncollectible operating revenues	7,170	8,795	*1,625
Taxes, operating	68,581	62,832	5,749
Electric building	49,027	48,747	280
Miscellaneous	6,098	6,843	*745
Total expenses	$688,172	$666,755	$ 21,417

SURPLUS.

Total income	$939,821	$929,714	$ 107
Total expenses	688,172	666,755	21,417
Gross income	251,649	272,959	*21,310
Interest on mortgage bonds	135,400	135,400	.....
Interest on collateral trust notes	9,395	16,589	*7,194
Other interest deductions	1,257	.....	1,257
Deductions from gross income.	146,052	151,989	*5,937
Net income	105,597	120,970	*15,373
Dividends on preferred stock	86,241	86,241	.....
Surplus	$ 19,356	$ 34,729	$ *15,373

RESOURCES.

Property and plant	$5,929,035
Construction work in progress	3,949
Current assets	136,728
Deferred charges	70,556
	$6,140,268

LIABILITIES.

Capital stock, common	$1,500,000
Capital stock, preferred	1,437,350
Bonded debt (outstanding)	2,708,000
Collateral trust notes	111,800
Current liabilities	263,543
Deferred credits	355
Reserve accounts	15,755
Surplus	103,465
	$6,140,268

The officers of the Cuyahoga Telephone Co. for the year 1914 are as follows: President, Chas. A. Otis; vice-president and general manager, C. Y. McVey; secretary and treasurer, H. O. Leinard. The directors are: Chas. A. Otis, C. Y. McVey, E. G. Tillotson, M. C. Harvey, F. H. McKnight, H. G. Dalton, Harry Coulby, N. C. McLoud, F. F. Prentiss, F. A. Davis, and Frederick W. Stevens.

Tri-State, of St. Paul, Issues Annual Report.

The annual report of the Tri-State Telephone & Telegraph Co., of Minneapolis and St. Paul, Minn., for the year ending December 31, 1913, which has just been issued, states that the general business conditions prevailing during the year were such that a conservative course was pursued and extensions into unoccupied territory curtailed to some extent. Expenditures were largely to provide extension and improved facilities to care for normal growth in the territory now served.

All exchange properties operated showed a healthy growth. The installation at the Snelling exchange was completed in July and is taxed to its capacity. The underground system was extended by the addition of more than 19 miles of conduit, and aerial leads extended to meet the demand in suburban districts. Approximately 70 miles of pole line and 500 miles of copper wire were added to the toll system and connection secured with 22 additional cities and towns. The toll line revenue increased more than 14 per cent. over that of the previous year. It is now practical to talk over Tri-State lines in one general direction between company exchanges approximately 600 miles apart.

During the year a careful survey of the entire system was conducted and replacements made wherever necessary. The property was maintained at the highest efficiency. Extensive road improvements within the state necessitated the moving of pole leads, and the very general patrolling of all lines somewhat increased maintenance cost. All replacements and maintenance of lines and equipment were treated as charges to renewals and to operating cost, and the plant accounts were not increased thereby.

With the opening of additional sub-exchanges the operating costs were temporarily increased. In many of the exchanges the number of messages or connections handled by operators increased 30 per cent. There was a steady increase in the number of toll messages and of local connections handled. The number of employes increased from 1,381 to 1,440.

During the year a controlling interest was secured in two non-competing properties, occupying territory not heretofore served by the company's lines. These properties, as well as those of all subsidiary companies, show a healthy growth.

The accounting system dictated by the Interstate Commerce Commission was installed January 1, 1913, and all books and

records of the company and its subsidiaries have, since that date, been kept in the prescribed form.

The surplus and reserve accounts continue to increase, now totaling 15 per cent. of plant value, and will, it is stated, be maintained.

The income account and balance sheet of the company are as follows:

INCOME ACCOUNT.

Income from operation	$1,556,054	
Income from sources other than operation	21,813	
Total income		$1,577,867
Operation, maintenance and general expense	$ 786,522	
Taxes—paid and accrued	55,823	
Interest on funded and floating debt	75,370	
Reserved for doubtful accounts	15,532	
Amortization of debt discount and expense	12,323	945,570
		$ 632,296
Dividends on preferred and common stock		361,709
Balance available for surplus and reserves		$ 270,587
Applied to Reserves:		
Renewals and reconstruction	$ 150,000	
Miscellaneous reserves	20,587	170,587
Balance transferred to surplus		$ 100,000

RESOURCES.

Plant and equipment, including real estate and buildings	$7,995,581
Stocks of system corporations	504,512
Advances to system corporations	76,328
Material and supplies	178,260
Notes and accounts receivable	98,612
Cash	94,943
Accrued income, not due, and deferred debit items	47,070
	$8,995,306

CAPITAL AND LIABILITIES.

Common stock, issued and outstanding		$4,000,000
Preferred stock, issued and outstanding		2,045,180
Funded debt, assumed in the purchase of properties		1,200,250
Notes and accounts payable		357,406
Accrued taxes, interest, dividends, etc		179,064
Reserves:		
Renewals and reconstruction reserve	$743,302	
Miscellaneous reserves	55,104	798,406
Surplus		415,000
		$8,995,306

Contingent liability on notes receivable discounted, $25,000.

The officers of the Tri-State Telephone & Telegraph Co. are as follows:

E. H. Moulton, president; G. W. Robinson, vice-president and treasurer; C. B. Randall, secretary; R. L. Barry, general superintendent; D. M. Neill, commercial superintendent; and A. C. Cragg, general auditor.

The report calls attention to the importance of the avowed change in attitude of the Bell company towards its competitors as expressed in the letter of the Bell company to the United States Attorney General. After quoting this letter in full, President E. H. Moulton and Treasurer G. W. Robinson make the following comment:

"The promise to refrain from the further purchase of competing properties insures to the public a continuation of competition where it already exists, and to the Independent operating companies it eliminates the possibilities of broken connections. The agreement to throw open the Bell long distance lines to connections with local Independent companies will prove a convenience to many patrons; and such connections will probably be established generally, assuming that the offer, when worked out in detail, insures fair and equitable terms and treatment to the connecting company and its patrons."

Report of Union Telephone Co., of Alma, Mich.

In conforming with the Interstate Commerce Commission's uniform system of accounts the Union Telephone Co., of Alma, Mich., has found it advisable to issue its annual report for the year ending December 31, 1913, instead of adhering to its fiscal year ending with the month of February. The period covered by the report was productive of highly satisfactory earnings, although there was a slight decrease in the number of subscribers' telephones. The company has now a total of 11,340 telephones at 37 exchanges and at miscellaneous points. Of this number 1,185 telephones were on lines owned by local corporations or co-partnership companies. In addition there are 3,805 telephones belonging to subscribers of locally owned lines connecting with the company's exchanges and toll lines.

The territory served by the company is described as being near the saturation point in the number of telephones per capita, and as there are no rapidly growing towns and cities, no considerable increase in number of stations can be expected. Some exchanges show a slight increase and others a slight loss. The loss is attributed to the enforcement of a rule requiring rentals to be paid quarterly in advance.

Notwithstanding the fact that there was a decrease in the number of telephones in service, the financial statement for the year reveals a very substantial increase in both the gross and net earnings. The total gross earnings for the year amount to $231,065, an increase of $7,366 over the earnings for the year ending December 31, 1912. The following is a condensed financial statement, which shows the earnings and expenses for the year ending December 31, 1913:

Telephone rentals	$156,504
Toll receipts	70,799
Miscellaneous income	3,762
Total income for the year	$231,065
Total expenses, including operating, maintenance, taxes and appropriation for depreciation reserve	140,803
Net profits	$ 90,262
Dividends paid to stockholders	67,709
Surplus earnings for year	$ 22,553

The net undivided profits for the year were $3,363 in excess of the undivided profits for the preceding year. The regular quarterly dividends amounting to 8 per cent. per annum on the capital stock were declared and paid during the year. The dividends for the year amounted to $67,709, making a total of $583,185 paid in dividends since the organization of the company. There have been issued 215 shares of treasury stock since February 28, 1913, for which the company received $11 per share, or $2,365. The total outstanding stock December 31, 1913, was 84,848 shares, leaving a balance of 15,152 shares of treasury stock on hand and available for issue.

The Owosso office building was completed last fall and has since been occupied jointly by the Owosso exchange and the general offices of the company. Beautiful in design, convenient in arrangement and complete in all its appointments, it has proven itself in every way to be well suited for the purposes for which it was designed. New switchboards have been installed to replace old ones in Hemlock, Merrill and Westphalia. A new two position toll switchboard was added to the equipment of the Alma exchange. The main switchboard and apparatus in the central office at Owosso has been replaced by

a new nine position lamp signal multiple switchboard, a two position chief operator's desk and a one position wire chief's desk. The new switchboard is known as a convertible type board, being fully equipped to furnish either magneto or central energy service.

The Owosso exchange has been for a number of years badly handicapped, as the business offered was largely in excess of the capacity of the plant. The ærial plant in the most congested section is being replaced by an all cable system of ample capacity. These improved and enlarged facilities will make it possible to take care of the increasing growth and will provide individual lines for a considerable number of people that have made application for that class of service. An underground system has been built in the city of Alma, consisting of 5,410 duct feet of main conduit and 1,904 duct feet of lateral conduit. This new underground system replaces the ærial plant in the business section of the city, which was built soon after the company was organized. The poles on which the original toll lines were strung are being rapidly replaced. During the past year 58 miles of these pole lines have been rebuilt. The method and style of construction has been greatly improved, and for that reason the rebuilt lines are far better and more substantial than the original plant. It is stated that every dollar used in the replacement of old plant has been taken from the depreciation reserve fund of the company.

Michigan State Telephone Company's Year.

The report of the Michigan State Telephone Co. for the year ended December 31, 1913, shows net earnings of $1,113,019, against $947,485 the previous year. The income account compares as follows:

	1913.	1912.
Gross earnings	$5,825,661	$5,193,923
Operating expenses	$2,574,418	$2,084,188
Current maintenance	1,129,271	1,081,328
Depreciation	640,000	786,037
Taxes	368,953	294,885
Total deductions	$4,712,642	$4,243,438
Net earnings	$1,113,019	$947,485
Interest	701,614	593,929
Balance	$411,405	$353,556
Preferred dividends	$162,740	*$136,995
Common dividends	245,632	*216,156
Total dividends	$408,372	$353,151
Surplus	$3,033	$405

*Includes dividends for last quarter of year on new securities issued October 1, 1913.

President B. E. Sunny, in his remark to the stockholders, says: "As of December 31, 1913, the total number of telephones in the city of Detroit was 83,267 as compared with 69,705 at December 31, 1912; 63,866 at December 31, 1911, and 16,017 at December 31, 1914. The growth of the business in the city of Detroit has been remarkably rapid, and with the growth of the number of telephones the traffic has increased until the calling rate per telephone is excessively high.

"The officers of your company now have before the Michigan Railroad Commission a proposed schedule of rates for the establishment of measured service in the city of Detroit, and they hope that in due time an adjustment will be reached that will greatly benefit the service and establish the right basis of charges therefor."

Report of Manitoba Government Telephones.

The sixth annual report of the Manitoba Government Telephones, for the fiscal year ending November 30, 1913, has just been issued. The system is operated under rates fixed by the Public Utilities Commissioner on July 1, 1912, and the report declares that these rates, as a whole, are sufficient to provide adequate revenue to meet requirements. The budget for the year 1913 included items aggregating $312,000 for depreciation and replacement of plant. During the year a percentage table, establishing a new basis for depreciation, received official approval. The adoption of this table fixed the amount at $373,431 for 1913. The replacement expenditure for replacement for the year amounted to $104,910, leaving an unexpended balance of $268,521. To this amount was added $37,966 unexpended balance on hand December 1, 1912, which was further augmented by an appropriation of $26,691 from the current year's surplus, making a grand total of $333,178 carried to depreciation reserve for replacement of plant.

The condensed earnings report and the balance sheet for the year are as follows:

CONDENSED EARNINGS REPORT.

Revenue—		
Exchange revenue	$1,355,692	
Toll revenue	335,238	
Sundry net earnings	16,220	
		$ 1,707,150
Expenses—		
Operation	$ 597,472	
Current maintenance	297,843	
Carried to replacement—trust acct.	373,431	
Taxes	1,164	
		$ 1,269,910
Net earnings		$ 437,240
Interest charges for year		406.975
Surplus		$ 30,265
Surplus carried to replacement, trust account		26,691
Balance due Provincial Treasurer		$ 3,574

BALANCE SHEET.

Assets—		
Plant	$ 9,624,878	
Office furniture and fixtures	25,167	
Supplies, tools and vehicles	395,044	
Cash and deposits	181,963	
Replacement, trust account, care of of Provincial Treasurer	326,691	
Accounts receivable	107,854	
Prepaid expenses	5,232	
		$10,666,829
Liabilities—		
Government investment	$10,156,026	
Accounts payable	83,236	
Unearned revenue	79,380	
Replacement reserves	343,794	
Provincial Treasurer, revenue account	3,073	
Provincial Treasurer, operating account	1,320	
		$10,666,829

The report lists 124 exchanges owned and operated by the Manitoba Government Telephones. These have a total of 34,039 local and 11,242 rural stations, or a grand total of 45,281 stations. Of this number Winnipeg exchanges had 25,550 stations and other provincial exchanges 19,731. During the year 2,190 exchange stations and 1,891 rural stations were added. The private branch exchanges numbered 3,790, an increase of 600, and the extension sets 3,647, an increase of 402.

In addition to the foregoing there are subscriber's stations owned by municipalities and local companies. Connecting systems had 459 local and 2,264 rural stations. Municipalities and local companies operate 16 exchanges. The total gain in the number of telephones in the province during the year was 5,173.

During the year the quality of telephone service through-

out the province including the city of Winnipeg, was carefully investigated and accurate records kept showing the results of over 10,000 tests. In the city of Winnipeg 2,000 subscribers were personally interviewed, with the result that 87.35 per cent. reported the service satisfactory. 9.30 per cent. reported the service fair and 3.35 per cent. reported the service unsatisfactory. Of the 2,000 special tests made, 91.2 per cent. were answered by the operators under eight seconds, and other tests made during the year from subscribers' premises for operators' answers, were found to average 4.6 seconds.

The number of complaints received in Winnipeg during the month of November, 1912, was 121, as compared with 49 in November, 1913, or one complaint per 210 stations in November, 1912, as compared with one complaint per 318 stations in November, 1913. Throughout the province, exclusive of Winnipeg, 4,413 subscribers were personally interviewed or called up during the year, with the result that 85 per cent. reported service satisfactory, 10.6 per cent. reported service fair and 6.4 per cent. reported service unsatisfactory.

The system has 1,282 employes, including 701 operators. The average monthly salary of operators in Winnipeg was $42.30 as compared with $39.80 the year previous. The minimum salary for operators is $30 a month for beginners and the maximum $47 for operators after three years of service. Toll operators, information operators, supervisors and chief operators scale to $85 per month. The average monthly salary of provincial operators outside of Winnipeg was $31 as compared with $29 the year previous. The average monthly salary of employes in other departments, not including heads of departments, is $80, as compared with $74.25 in November, 1912.

The demand for additional service throughout the province necessitated extensive construction work for the year, including eight new exchanges, seven toll offices and 2,012 miles of rural construction.

Ethical Telephone Rates—Their Relation to Service

The Flat Rate System of Charging for Service Versus the Measured Service System—The Relation of these Systems to the Welfare and Growth of the Service—Factors to be Considered in Making Rates

By N. G. Warth

Our American form of government is based upon the principle of the greatest good for the greatest number of the people, and not upon any plan of the greatest good for the few at the expense of the many. In public service matters, this grand and fundamental principle should be recognized, applied and adhered to and in no class of public service more than in our methods and means for communication and transportation, particularly of communication.

The most natural, convenient and general method of communication is, of course, through spoken words between people in close association; and the next in order correspondingly, nowadays, is that through conversation by telephone between people at considerable distances apart. The next most common and convenient method is by writing or mail, involving transportation for delivery, while the next method, in order of use, is by telegraphing.

Benefits of More General Telephone Service.

It is obvious that the freer or more general and cheaper that communication can be had by telephone—the second most convenient method, which is the foremost convenient and quickest method of communicating at a distance—the larger will be the results and benefits to the greatest number of the people. Hence all attempts at hedging about our telephone means of communication by vexatious restrictions and by making it unnecessarily costly, should be prevented, and where such conditions exist they should be corrected by the utilities commissions having jurisdiction. Any undue control of a public service, so vital to our national welfare as is our common means of communication, is as detrimental and dangerous as would be a monopoly of a main food supply or an encroachment on our liberty.

The telephone business was developed through the system known as the flat rate plan of charging for service, which we all know is based upon the principle of so-called unlimited service at a regular price per month. In comparatively recent years the scheme, variously designated as the measured service, measured rate service, or metered rate service plan of charging for service, has been extensively adopted in the larger cities.

The telephone business probably never could have been developed had the latter scheme of charging prevailed from the start. Thus if the flat rate system was necessary in establishing the business, it would seem to be the best with which to continue to expand and operate it.

The principal reason vouchsafed for resorting to the measured service plan of charging is that of securing pay for all service rendered, i. e., forcing deadheads to cease using the service; to become subscribers, or, when they continued to use subscribers' telephones, causing the subscribers to pay for such service. The net results, where introduced, are: That the peg counts show an average reduction of 40 to 50 per cent. in connections, with a reduction of 20 per cent. in operators' costs; some of the former deadheads become subscribers and some patronize pay stations; the subscribers curtail their use of the service by restricting calls largely to matters of importance or real business necessity; and the service is improved by reason of the reduced volume or rate of calling. Incidentally the reduced volume of service effects a corresponding saving in the use, or the wear and tear of equipment, together with relatively less cost for energy for storage batteries, ringing machines, etc. The registering and counting of calls by operators or meters, the booking, billing, etc., incident to the system introduces considerable additional expense and complexity compared to the flat rate system.

It will be seen that this system makes good for the objects sought and for the operating company along the lines designed but the gain to the company is of doubtful value, as will be evident; and the public, for whom the entire service is, theoretically at least, created, receives therein little or no consideration. It will be apparent that the measured service plan is a mere device, under present circumstances, for securing as much or more earnings and profits from a restricted and relatively decreased volume of service, resulting in increasing the cost pro rata and diminishing the value of the service to the public.

For a third of a century, flat rates have produced a popular class of service and fat profits. Now that we have commission control, both federal and state, of public utilities, whereby rates, it is assumed and has been assured, are to be restricted to fair returns upon the investments and assuming that this principle will be enforced by the com-

missions, there would be no valid reason for the companies abandoning popular flat rates and resorting to unpopular measured service rates. Commission control of the rates should put a quietus to the agitation for message service as the means of adjusting the rates to the "value of the service to the subscriber," which is similar to the old time railroad game of charging all the traffic would bear. It is an un-American principle of charging for a public service, yet quite prevalent in America, and should never be permitted, as the public is entitled to service from all privately owned and operated public utilities at rates based upon a fair return only upon the investment.

As to deadhead service under flat rates, it may be explained that it never was as much of a burden as it was a benefit, for the reason that it cost the companies comparatively little and resulted in beneficially advertising the telephone and its many advantages in business and social affairs. Most of the deadheading was done, too, during the period when the rates for service were maintained very high under patent protection and the majority of those so using the service could not afford the service. Most of the deadheads became subscribers when the rates were reduced through the effects of competition. That was a clear demonstration that the telephone business is dependent for its maximum beneficial results upon popular service conditions and low rates, i. e., that the number of telephones and the extensiveness of use, both will be stimulated by liberal management, while free control, tight control, illiberal and restricting, will discourage use, growth and universality, thus defeating the real destiny of the telephone.

Measured Service Inadvisable.

The movement for the adoption of measured service as the means, either for the purpose of enforcing pay for all service rendered, or for the purpose of increasing profits, is subversive of the broadest principles of a public service of the nature of telephone communication, wherein the interchange of intelligence, depending upon interdependence of the facility, is necessary to value. It is inadvisable because more comprehensive results, as to both objects, can be attained through the continuance of flat rate service properly graded and rated.

The days of a restricted telephone service, through prohibitive prices for greatest net profits, vanished with patent monopoly, never to return. Any rate-boosting scheme which works along parallel lines will not be tolerated by the people, who know what they want when they see it, as has already been demonstrated in the business. That which the people want is what will have to be furnished them, and that clearly may not coincide with what some telephone utilities would very much prefer to dictate they should have. What the people want is a classified flat rate service, as that, with its flexibility and freedom of use, more nearly fits their general requirements than any other scheme for furnishing service.

The message rate scheme was extensively introduced during a period when it was possible for a public utility to dictate what the public should have or must take in the way of service, both as to class and quality; and when the utility could enforce rates which would make its profits anything it desired. But now in treating with an enlightened public and with profits to be properly restricted, through commission regulation, to a fair and reasonable return on the correct cost of service, the class will have to be what is best for the public, and thus best for all concerned.

Large vs. Small User.

Adjusting the charge to "the value of the service to the subscriber" under the measured rate scheme, is also unfair in the sense that, while it hits the large user of the service in proportion to his use, it does not fairly adjust the price to the small user who is compelled to pay, as a minimum, as much for the service as before, yet is so restricted in its use that the value to him is reduced. That is a manifestly unfair, illogical and detrimental condition for maximum public benefit in intercommunication. It would not appear to be as unfair or as unfortunate, when flat rates are adjusted to cover the costs and profits of service, for a utility to furnish some free or deadhead service, as it is for subscribers with measured service to be restricted unnecessarily in their use of it.

The development nowadays largely depends upon the small user taking service, and the more freely the small users—the masses—are enabled to use the service, the better for the larger users. Such use develops business in all lines, and thus in turn benefits the telephone utility by compelling the larger users to increase their facilities, or capacity, and expenses for telephonic communication.

The classified flat rate service should consist, as heretofore, in individual and party line distinctions of supply, graded according to the requirements for securing a maximum distribution of telephones, together with approximately fairly adjusted usage of the service to prevent abuses on the part of occasional large users on party lines. In the main, the heaviest, originating users of the service are public offices and utilities, or quasi-public utilities, of public benefit, as city and county offices, railway offices, transfer offices, lighting and heating companies and newspapers. They require and usually subscribe for facilities and service in proportion to their requirements, from one individual line to large private branch exchanges with numerous main line trunks.

It will be seen that service upon the flat rate basis, establishes a sufficiently "measured" use, as the capacity in calls or communications of one line, i. e., its natural limit of use, is the unit of measurement. The rates, being based upon that condition, the subscriber pays for his unit or units, or part of a unit, according to whether he has communications occupying one line, several, or but a fractional part of the capacity of a line, as with any class of party line service. In long distance service, in estimating for facilities, the capacity of a line, or a circuit-load, per day, is 45 completed messages, yet the actual number often greatly exceeds that number. Likewise, in local service, while the average number of calls per day which demand operator capacity, may be five or eight per subscriber, it is frequently greatly exceeded in individual instances, the number at times reaching several hundred per circuit per day. In many instances, subscribers pay for a full exchange unit—an individual line—and do not average one call or service unit of use per day; in fact many subscribers pay for service and do not actually use it for days or weeks at a time. The companies have never been known to grumble at such instances, yet such conditions bring about the average of service furnished, for which proportionately, the utilities train and employ operators.

Law of Averages in Operating Costs.

A law of averages has to be applied as a factor in fixing the cost of operating, as not to exceed 5 per cent. of the subscribers are excessive users, and the majority are small users of the service. Comparatively few subscribers use their facilities to their maximum capacity. Frequently the largest use, and consequent value of the service, lies with subscribers who have a majority of incoming calls, which they secure at no expense with either plan of charging. With such varying and inconsistent conditions it would be fallacious to try to charge for service according to its value to the subscriber, on a basis of originated calls.

With measured service conditions, a party originating excess calls will pay the guarantee price plus the charge for the excess messages and a party using the service least, will pay the guarantee price, with no refund for the unearned charge. Thus the utility, permitted to charge all around high rates, derives disproportionate profits from the small user, while furnishing probably a good but restricted and unpopular service. Hence, as a public proposition, and it isn't anything else, it would be better to have a good, popular, flat rate service, with rates properly adjusted thereto for creating the permitted ratio of profit for the utility than to have an unpopular restricted measured rate service with its attendant "measuring" work and troubles.

This "measured rate vs. flat rate" controversy, on the part of the measured service advocates, is explained and justified as being the rational and fair method of charging for telephone service, because it is predicated upon the methods used in selling gas, water, electrical energy, etc., by public utilities, which they claim to be similar classes of public service. The claim of similarity is not justified as the conditions are so different, mainly by reason of the fact that electrical energy, gas and water, though sometimes furnished upon a flat rate basis, can be wasted and dissipated, thus destroying property or a value vested in the means or the thing and in a manner not controllable, as those products or facilities of the utilities are entirely under the control of the patron or consumer. With telephone service furnished upon the flat rate basis the case is far different, as it has to be secured through the exchange in a specific manner, under certain control, in manual operation, of the utility and the quantity used, or the extent of the service, cannot be in excess of the natural limit of use the price entitles the user to for his stipulated class of service, each class having its natural limit of use or limitation due to time.

A Quasi-Public Service Comparison.

The conditions are more similar to those in some other classes of quasi-public service, one instance of which would be hotel service, in which quarters are taken on a flat rate basis per day, week or month, with hot and cold water always on tap, electric light likewise on tap, heat when wanted and other incidental "service" as required, etc. One can use the quarters and the facilities furnished or available therewith, one hour per day, one day per week, etc., and the price remains fixed, because the natural limit of use would really be all day, all week or all month, respectively, according to the price and time arrangement. All the use one can get of such facilities and service, under certain control by the hotel management would be within the anticipated quantity, which was measured in advance when the hotel management adjusted the flat rates for the various classes of rooms, suits, etc., to the cost of its plant, expenses and its fair and reasonable profit upon its investment as a whole, the price in each instance covering the probable service, even to the possible limit of use.

When subscribers' facilities become congested, they can always secure relief by increasing them. Flat rates induce freedom of use, and freedom of use tends, more than does restriction of use by measured service, to produce congestion. Hence extra facilities become necessary through popular service influencing the party line subscriber to have individual line service, and the individual line subscriber to have an additional line or a private branch exchange.

In a popular telephone service, it is as necessary to have a classified service, i. e., individual line and all the various classes of party line service, etc., as in transportation service it is necessary to have individual and common accommodations whereby the various patrons, according to desire, may travel in a private car or train, a Pullman, or in an ordinary car; and in neither class will the cost to them be based upon its value to them, yet railroad transportation is now a very well regulated public utility service.

Regulation of telephone utilities' practices, their service and rates, for the greatest good to the greatest number of the people, now appears to be entirely feasible with full justice to the investors and the public, by reason of the stabilized conditions surrounding the furnishing of service as compared with the changing conditions of some years ago. Now the plant factors are practically regular and permanent, and with semi-automatic and automatic operation in switching, which favors and facilitates the functions of an exchange, the costs of service will not vary much. With the new types of switching mechanism more generally applied, as is now the practice in European countries, greatly reduced manual operation will ensue, and the rates for service need not be revised upward. In many instances they may very considerably be revised downward, as the costs of operation (switching) will not increase with the growth in the volume of usage, as in the unfortunate result with the old all manual systems, the subscriber performing the necessary functions to cause the machine switchboard to do the work of establishing the connections.

Basis of Rates in Future.

Rates in the future will not be predicated upon costs including much service of operators. Automatic operation, caused by the subscribers' manipulations, will not require a real "service" of the public utility, nor will it furnish a commodity. It will furnish rather, a facility for use, merely a means for the subscriber's personal use in communicating; and that means will be almost as mechanical and devoid of the element of special service as the furnishing of electric energy for light or power. The utility will provide the the plant and apparatus, the subscriber will do the rest, i. e., he will turn the switch and get his party as wanted, just as in turning the other switch he gets his light or power. The factor of operator costs is eliminated and with that all pretenses as to climbing expenses justifying higher rates. All this shows that the automatic types of exchanges are, if anything, even more peculiarly adapted to flat rate service than the manual system, besides their higher speed of operation produces an increased limit of use per circuit.

It is obvious, of course, that measured service, per se, is not objectionable, if the utility prefers it, as that method of charging, if adjusted properly to the conditions of service and the desires of the people for freedom of use, would be just as cheap and practically the equivalent of the flat rate service, but if such were the case, it would be better to stick to the flat rate plan, as it would be folly to bother with guarantees covering minimum usage, forfeitures, tallying calls, counting them, splitting collections, buying meters, etc.

To establish an equivalent condition is not the intention on the part of the measured service partisans as what they are after is a pretense, a device to enable them to get more for less.

Now that the honor of commission control has been thrust upon us, taking the place of regulation through competition, the people must insist upon effective commission regulation to the end that the telephone utilities will base their practices and rates upon the improved conditions now underlying and possible for the furnishing of telephone service, that the public may have a guarantee of fair treatment, flat rates, with the lowest properly remunerative prices possible; that "talk may be cheap" and business good.

From Factory and Salesroom

Conventions: Missouri, Kansas City, May 6, 7; Tri-State, Jackson, Tenn., May 19, 20; Railway Telegraph Superintendents, New Orleans, May 19, 20, 21 and 22

Pacific Coast Representatives of Garford Mfg. Co.

The Garford Mfg. Co., of Elyria, Ohio, has arranged to market its various telephone and other lines on the Pacific Coast through the following distributors. The Dean Electric Co. of California, with headquarters at No. 413 Currier Bldg., Los Angeles, Cal., and the Dean Electric Co. of Washington, with headquarters at 216 Second avenue South, Seattle, Wash.

The southwest section will be served by the Dean Electric Co. of California, of which company F. M. Coker is secretary and manager.

The northwest section will be served by the Dean Electric Co. of Washington, of which J. M. Abrams is secretary and manager. H. Hall T. Glessner will also be associated with this company.

The many Dean customers on the coast will be more than pleased to know that practically the exact organization which served them so faithfully in the past, is included in the personnel of these two companies, so that they will secure absolutely the same service to which they have been accustomed.

A carefully selected stock necessary to supply the trade will be carried at both the Seattle and the Los Angeles offices, insuring more prompt shipment than ever before.

Short Cut Suggestions to Users of Matthews Telefault.

By O. F. Tallman, Trouble Shooter.

The Matthews', Type A, Telefault is used by so many telephone companies which have realized the time and expense it saves in locating faults in cable, as compared to the old methods, that the following suggestions for simplifying the locating of cable trouble through its use will be of interest to many troublemen. The various classes of trouble will be taken up separately.

What is termed "a short," is actually a cross on the pairs in trouble between the odd and even wire, or tip and ring. Where it has been determined that this is the case, a wire should be run from one of the binding posts of the Telefault instrument to the odd wire of the pair in trouble, and another from the remaining binding post to the even wire. This forms a complete circuit from the Telefault instrument

The Matthews Telefault.

over the odd wire of cable pairs to the short to be located and back over the even wire to the instrument. This creates a zone or field limited to the circuit over which the tone generated by the Telefault instrument travels when switches are closed and the vibrator starts.

The Telefault exploring coil is so constructed that when it is brought within this field, or zone, it picks up by induction and transmits to the receiver, the tone generated by the Telefault instrument. The coil is connected in series with the receiver. Before leaving the Telefault instrument, it is advisable to make a test with the exploring coil to familiarize oneself with the volume of tone which may be expected when looking for the trouble on the cable.

Another test that should be made is as follows: With the exploring coil held between the two wires leading from the Telefault instrument to the pair in trouble, listen carefully and determine if any difference in the volume of tone can be noticed when a "short" is placed temporarily at the point where the lead wires from the Telefault instrument are connected to the pair in trouble. This will give an approximate idea of the distance from the instrument at which to expect to find the trouble. The higher the resistance the weaker will be the volume of tone.

In making this test be sure that the tone from the Telefault instrument is not being picked up directly, but that it is from the zone between the pair of wires connecting the Telefault instrument to the pair of wires in trouble. If this preliminary test is made on each case of trouble, it will not be long before one will be able to estimate very closely the location of the trouble. This will, of course, save much time and unnecessary climbing of poles. It can readily be appreciated that experience will increase one's accuracy in judging distances by this means.

After making the approximate location as described, it is advisable that a test be made about every fifth pole, until the trouble is located within a distance of five poles. Next divide the distance and make a test on the center pole of the five; then of the three, and the trouble will be found within one span. This, of course, is on the assumption that the trouble has not been located on previous tests. If the trouble has not been located in any of these pole climbing tests, it will be necessary to ride the messenger in a strand chair in order to obtain an exact location of the trouble.

It will be found that so long as the troubleman is between the Telefault instrument and the trouble, the tone will be heard through the Telefault exploring coil and receiver, but beyond the point of the trouble no tone will be heard. The point where the tone ceases is the point where the trouble is located.

"A cross" is made when the even or odd conductor becomes crossed with some adjoining wire or wires. In attempting to locate a cross, the same method should be followed as that given for locating a "short," i. e., the two wires from the Telefault instrument are connected in series with the two crossed conductors in the cable. It will be found on making comparative tests that a cross is more easily located than a short. This is because of the fact that the volume of tone is much stronger for a cross than it is for a short, due to the construction of the cable. The conductors of a pair lie much closer together and are also transposed more frequently, thereby causing the tone to be cut down considerably. It will also be noticed that the nearer the conductors in trouble are to the lead sheath of the cable, the more distinct will be the tone. This is the case in all cable trouble.

"A ground" is made when one or more of the conductors come in contact with the cable sheath. For locating purposes, this is the only definition of a ground which should

be considered. When a conductor becomes crossed with the grounded side of another line, it is reported to the troubleman as "a grounded line," but it is actually a cross and should be so considered for locating purposes. This has been the greatest stumbling block to users of Matthews' Telefault, and those who do not know better, usually blame the instrument for their own lack of knowledge on this point.

The troubleman should make a check test to determine whether or not the ground reported to him is actually a sheathing ground or a cross to ground. If the latter, it should be treated as a cross and not as a ground. To determine whether or not one has a true ground to find, use the Telefault instrument as a tone test set; i. e., ground one side through a condenser and connect the other side to the wire in trouble. This connection should be made at a point where all of the pairs of the cable in trouble are accessible; it might be at the main frame, at a distributing box on the line, or where the cable has been cut open. If an actual sheathing ground is determined, connect the Telefault in series to the conductor in trouble and the sheath of the same cable and it will be found that there will be no trouble in making the location. If it is other than a sheathing ground, a false location will be obtained.

With one side of the receiver grounded, run over the cable carefully and determine whether it is crossed with some other conductor. If this happens to be the case, the tone will come up very strong in the receiver when the crossed pair is reached. If the trouble proves to be a cross, locate it as such; but if no cross is found and one is sure the conductor is not in trouble outside of the cable, it will be safe to assume that the trouble is a cable or a sheathing ground.

For an actual "sheathing ground," connect the Telefault in series to the conductor in trouble and the sheath of the same cable. If this is done, the user will have no trouble in making the location.

When it has been determined that the cable is wet, the best method of testing is to choose from six to ten pairs (those showing the lowest resistance) and connect an equal number to each binding post of the Telefault instrument. Then proceed to locate the trouble as in attempting to find a cross. Be very careful to see that no pair included in the bunch selected has an old trouble, as that is likely to confuse one when hunting for the "wet trouble." For example: Pair 47 might be an old ground which has been discarded in the past and replaced by a spare pair. The man who did this probably intended to clear up the trouble at some future date, but neglected to do so and no record was made of the matter. Because this pair shows a very low resistance, it might be thought that it would be an excellent pair to use as an aid to locating the "wet spot." The very fact that it does show a much lower resistance than other pairs in the same cable should be a warning signal for the tester to be very sure before accepting it; otherwise, it will cause a false location. The safest thing to do is to select eight or ten lines, which are known to be working lines and free from trouble, and disconnect all other outside lines.

The writer has been using a Telefault for several years and the only kind of trouble he has ever failed to locate with it are "opens." Any questions which readers may care to ask will be gladly answered direct or through TELEPHONY.

Book Reviews.

SIMPLE SOLDERING, by Edward Thatcher; published by Spon & Chamberlain, New York. Price 50 cents.

In the preparation of this book, the author, who is instructor of decorative metal work in Columbia University, has taken the "how" rather than the "why" standpoint. The joining of both hard and soft metals is dealt with in the book, and the proper methods of securing the desired results in the simplest possible manner are presented in a clear and comprehensive style.

Over 50 illustrations aid in making plain the various points involved. Descriptions are given of inexpensive home-made apparatus which may be called into service for both hard and soft soldering.

It is stated that, although the book has been out but a short time, hundreds of copies have been sold, which would indicate an ultimate large demand. Whether purchased for use in connection with telephone work or otherwise, one can hardly fail to find in it some information of practical value.

ELECTRIC TOY MAKING, FOR AMATEURS, by T. O'Connor Sloane; published by the Norman W. Henley Publishing Co., New York; 210 pages, 77 illustrations. Price $1.

The Introduction states that this work, of which the present edition is the twentieth, treats of the making of electrical toys and general electrical apparatus, and is designed to bring within reach of young and old, the manufacture of genuine and useful appliances. The book starts with an explanation and description of various primary batteries and how they may be made. Magnets, both permanent and electro, are discussed and various experiments described which, to the uninitiated, appear quite mysterious. The construction of small motors is described.

The combination of battery cells, magnets and motors for making various electric toys is suggested and details given in many cases. For the boy with an inclination toward experimenting along electrical lines, the book will be very interesting.

THE PRACTICAL TELEPHONE HANDBOOK AND GUIDE TO THE TELEPHONE EXCHANGE, by J. Poole; published by Whittaker & Co., London and New York; fifth edition; 624 pages, with 535 illustrations. Price $1.50 (6s).

This book, now in its fifth edition, scarcely needs an introduction to telephone men, especially in England and adjoining countries. While it deals largely with telephony as practiced in England, the circuits and practice are so closely related with American usage that the book is extremely useful to telephone men in this country, especially as the apparatus and systems in use here are quite fully described.

Owing to the rapid increase in the use of automatic equipment in England, the chapter relating to that branch of telephony has been rewritten in order to keep pace with the changes in the principles of working. A detailed description is given of the operation of the Strowger system as installed in England; also of semi-automatic equipment.

Additions have also been made to the chapter on long distance lines, in which the Pupin system of loading is discussed, so as to include the theory of artificial lines. The chapter on miscellaneous applications of the telephone has been enlarged and several of the tables in the Appendix have been brought up to date.

The book is especially valuable to students and others who desire to secure a theoretical and practical knowledge of telephony in all of its many branches.

Rubber Insulation Report.

The report of the joint rubber insulation committee, recommending a well defined method of procedure in the analysis of rubber for insulation and other uses, has just been reprinted by the Simplex Wire & Cable Co., Boston, Mass. The full report, consisting of 24 pages, provides a fine method of avoiding misunderstandings in working with rubber analyses. This report was prepared by a number of interests identified with this subject, including the United States Signal Service and Bureau of Standards, the American Chemical Society, two of the large trunk line railroads and four of the manufacturers of rubber-insulated wires, of which the Simplex company was one.

The Career of Max McGraw.

Max McGraw, president of the new McGraw Co., formed by the merger of the Interstate Electric & Mfg. Co., of Sioux City, Iowa, and the Jos. R. Lehmer Co., of Omaha, Neb., is only 31 years of age, but is at the head of a corporation doing an annual volume of business of a million dollars. Mr. McGraw's career is a remarkable example of what consistent hustling in pursuit of a business ideal will accomplish. He began his business career when a school boy, by carrying a news-route covering 7½ miles. He covered this route in the early morning hours, and then, far from being daunted by the responsibility, decided to cover the same route at night. For six years he made 15 miles daily on horseback through summer and winter, rain and snow, and traveled in that time a total of approximately 35,000 miles.

Max McGraw

He was attracted by anything pertaining to electricity and spent his odd moments studying along this line. With a fellow playmate, Ross Brown, young McGraw rigged up a telephone plant between their homes. Deciding to become an electrician, he subscribed to a correspondence course and at 17, having saved $500 from his news-routes, he established himself as an electrician. He continued his news-routes, however, for six months until compelled to give it up because of the pressure of electrical work that came to him. His first important job was a contract to wire a residence, which he completed with credit to himself. Fired with ambition, McGraw worked hard during his first year as an electrician and then with Frank G. Smith as partner, formed the McGraw Electric Co.

After six months Mr. McGraw, senior, bought out the half interest owned by Frank G. Smith and the partnership between the two was dissolved. Mr. Smith is now manager of the Elwood Telephone Co., of Sac City, Iowa, and a good customer of the McGraw Co. Max McGraw's father continued a silent partner throughout the life of the McGraw Electric Co. Young McGraw soon secured two important contracts, the first to install a complete electric light and power plant at the Sioux City Stock Yards, at a cost of $12,000, and the second a job of wiring and installing a lighting system in the Sioux City Opera House, at a cost of $10,000. How satisfactorily were these contracts executed may be judged from the fact that in the spring of 1913 the Sioux City Stock Yards doubled the size of its electric light and power plant and the contract was voluntarily given to McGraw.

The McGraw Electric Co. continued in successful business until 1903, a period of three years, at which time young McGraw attained his majority, and decided to branch out on a larger scale. A new company, known as the Interstate Supply Co. was organized with substantial backing.

Young McGraw's impression of an ideal electrical business was that furnished by the firm of Jos. R. Lehmer Co., of Omaha, and he worked assiduously to pattern his business after that of the successful Omahaian. The new firm added mill and factory supplies to its electrical equipment business, and the firm's sales grew by leaps and bounds. W. J. McGraw, father of Max McGraw, soon disposed of his wholesale fruit and produce business and began to take an active interest in the affairs of his son's company. He is today treasurer of the McGraw Co., making his residence in Los Angeles.

In 1907 Max McGraw organized a company independent of the Interstate Supply Co. for the purpose of manufacturing magneto, telephone and light and power switchboards, the telephone being the design of R. Hanson, who was made superintendent of the factory. The company continued in successful operation as the Interstate Electric Mfg. Co. until 1910, when McGraw consolidated it with the Interstate Supply Co., under the name of the Interstate Electric & Mfg. Co.

In February, 1912, occurred the death of Joseph R. Lehmer and the estate sold out the business to Max McGraw, the young man who had made it his ideal. Finding many disadvantages in continuing the two businesses under separate names the Joseph R. Lehmer Co. and the Interstate Electric & Mfg. Co. were consolidated as The McGraw Co. On March 1, 1914, E. B. Perrigo, retired from active management of the McGraw Co., Omaha, and the management was assumed by Max McGraw, who will divide his time equally between Sioux City and Omaha.

Paragraphs.

Chattanooga Pole Co., Chattanooga, Tenn., is sending out an attractive leaflet regarding chestnut poles, one illustration of which shows a lead of 60-ft. poles. This company has specialized for 14 years in chestnut poles.

A. V. Overshiner, of Chicago, is now advertising manager of the Garford Mfg. Co., Elyria, Ohio. Mr. Overshiner is well known to Independent telephone men, having been engaged in the industry for the past 15 years in the operating manufacturing and selling ends.

The United States Light & Heating Co., of Niagara Falls, N. Y., manufacturer of the U-S-L electric starter and lighter, U-S-L storage batteries and U-S-L axle electric car lighting equipments, has removed its Chicago branch sales office from 1013 Peoples Gas Building to 2335 State Street. This change brings the company's sales office and service stations into the same building. The railway department of the Chicago office is now under H. A. Matthews. R. E. Stuntz has charge of the battery and starter department, and the service department is being looked after by H. M. Emerson.

Louis M. Pignolet, manufacturer of electrical measuring instruments, 78 Cortland street, New York City, has published a new edition of his booklet on testing, with text revised to be adaptable to the new Pignolet instruments. The new instruments have twice as many scale divisions as the old, thus permitting more accurate readings of resistances, etc. The booklet contains information which will be of great benefit to telephone men in testing lines. A copy will be sent free to any telephone company making request of Mr. Pignolet.

Indiana Steel & Wire Co., Muncie, Ind., is sending out a circular that is certain to attract attention. It is entitled "Ask the Man Who Knows" and introduces the reader, by use of an outline cut of a lineman in his working clothes and accoutrements, to the expert who knows from experience what wire will do. The company urges that tests be made of wire before purchasing, and that the linemen be given a chance to make these tests, which are simple and inexpensive.

Harry C. Slemin, advertising manager of the Yawman & Erbe Mfg. Co., Rochester, N. Y., is applying to his new work, the same inspiring, red-blooded methods he used so successfully with the Stromberg-Carlson company. Among his duties is that of editor of "The Y & E Idea," the house organ of the Y & E organization. The April issue, which has just been issued, contains many articles, the reading of which will inspire the salesmen and dealers to greater efforts. The issue contains an announcement of Mr. Slemin's appointment as advertising manager and is accompanied by his photograph and a sketch of his career.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

A. C. MERRITT, of Morrilton, Ark., has been appointed local manager for the Southwestern Telegraph & Telephone Co., at Heber Springs, Ark.

F. F. ZIMMERMAN, of Halls, Tenn., has been appointed local manager for the Cumberland Telephone and Telegraph Co., at Henning, Tenn., to succeed C. Walter Cates, resigned.

E. L. BARRON, formerly manager of the Allentown, Pa., division of the Consolidated Telephone Co., has been made superintendent of the Scranton office, to succeed E. O. Zarker.

GEORGE R. KNOX, formerly of the treasurer's office of the Southern Bell Telephone & Telegraph Co., in Nashville, Tenn., has been promoted to the position of district manager, with headquarters at Birmingham, Ala.

H. C. BROWN, for the past two years district manager for the Chesapeake & Potomac Telephone Co., with headquarters at Cumberland, Md., has been promoted to a position on the company's general staff at Baltimore.

HORACE F. HILL, formerly general manager of the Chicago Telephone Co. and the Illinois division of the Central Union Telephone Co., has been elected vice-president of the Central Group of Bell Telephone Companies.

EDWARD WILLIAMSON, for several years connected with the Central Union Telephone Co., at Galena, Ill., has accepted the position of manager for the Savanna Mutual Telephone Co., at Savanna, Ill., to succeed O. E. Metzler resigned.

W. G. HASKEY, for the past seven years district manager of the Slate Belt Telephone & Telegraph Co., with headquarters in Bangor, Me., has resigned to accept the position of general manager of the Blue Mountain Telephone & Telegraph Co., with offices at Bangor.

CHARLES E. MOSLEY, treasurer of the Central Group of Bell Telephone Companies, has retired under the pension rule. In honor of his 25 years' service with the Bell company, Mr. Mosley was entertained at luncheon by the officials of the Central Group, who presented him with a valuable watch.

W. R. ABBOTT, who for more than 20 years has been identified with the Chicago Telephone Co. in the various positions of order clerk, chief clerk to the general superintendent, special agent in rights of way and claims, superintendent of suburban division and general commercial agent, has been appointed treasurer of the Central Group of Bell Telephone Companies to succeed Mr. Mosley, who has retired.

E. O. ZARKER, formerly superintendent of the Scranton, Pa., office of the Consolidated Telephone Co., has been promoted to manager of the Carbondale division, having under his supervision the towns and exchanges of Honesdale, Hawley, Waymart, Jermyn and Peckville. Mr. Zarker was presented with a beautiful gold clock by his fellow employes as a token of their esteem and good wishes in his new position.

Obituary.

C. B. WIGGINS, assistant general manager of the Delaware & Atlantic Telephone & Telegraph Co., Camden, N. J., passed away on March 18, after a short illness of pneumonia.

New Companies and Incorporations.

DAHLONEGA, GA.—Articles of incorporation have been filed by the Caney Creek Telephone Co. with a capital stock of $5,000. The incorporators are: J. W. Justus, F. J. Williams and others.

BALDWIN, ILL.—The Baldwin Telephone Co. has been incorporated with $2,000 capital stock by Henry Lucht, W. R. Preston and A. H. Wiltshire.

NEW CORYDON, IND.—The New Corydon Telephone Co. has been incorporated with $4,000 capital stock by Frank B. Langenhorst, Gustave Shindler and Elmer Gibson, all of Bryant, Ind.

SAGINAW, MICH.—The Mackinac County Telephone Co. has been incorporated with $1,000 capital stock by Jessie Fenley, Oscar Slack and John Elsner, all of this city.

WALDRON, MICH.—The Waldron Telephone Co. has filed articles of incorporation with $5,000 capital stock. The directors are Chas. C. Case, E. F. Connor and Guy Smith, all of Waldron, Mich. (Not a new company.)

EAST CHATHAM, N. Y.—The New Concord Telephone Co. has filed articles of incorporation with $500 capital stock. The directors are: E. C. White, James D. Campbell, William King, and Charles H. Clark, of East Chatham; J. Edwin Brown, John C. Daley, and Edward J. Colbert, of Chatham; Philip Frisbee, of Canaan.

CRABTREE, ORE.—The Crabtree Co-operative Telephone Ass'n has filed articles of incorporation with $125 capital stock. The directors are: H. C. Asher, E. Dorgan, C. C. Snyder, J. W. Kinzer and W. J. Turnidge.

DALLAS, S. D.—Articles of incorporation have been filed by the Southeast Tripp Telephone Co. with $10,000 capital stock. The incorporators are Ernest Prinz, Herman Stamer and W. O. Cowan, all of Dallas.

DELL RAPIDS, S. D.—The Twin Mound Rural Telephone Co. has been incorporated with $2,500 capital stock by E. J. Zellmer, T. S. Braa and Gilbert Braa, all of Dell Rapids.

OWANKA, S. D.—The Short Line 'Phone Co. has been incorporated with $2,000 capital stock by F. B. Stiles, of Owanka, and G. A. Bailey and F. H. Rector, of New Underwood, S. D.

SWEENEY, TEX.—The Sweeney Co-operative Telephone Co. has perfected organization and will at once begin the construction of telephone lines. The officers of the company are as follows: L. A. Riley, president; O. Schadler, vice-president; L. W. Engberg, secretary; Dr. M. H. Eades, treasurer, and H. W. Draper, manager.

SOUTH RYEGATE, VT.—The Corinth & Newbury Telephone Co. has filed articles of incorporation with $1,500 capital stock. The incorporators are R. H. Waldron and W. C. Chamberlain, of South Ryegate, and R. E. Burroughs, of Wells River.

GLENWOOD CITY, WIS.—The Wisconsin Telephone Co. will reconstruct its line between this city and Menominie with copper wire.

RIVESVILLE, W. VA.—The Hoodsville Telephone Co. has been incorporated with a capital stock of $2,500 by W. D. Barb, Lee Swisher and others.

BOYCEVILLE, WIS.—The Boyceville Telephone Co. has been incorporated with $10,000 capital stock, and will take over the lines of the Knapp Telephone Co., of Knapp, Wis. The incorporators are W. H. Park, of Glenwood City; O. E. Skamser, V. B. Lewis, C. W. Hayes, of Boyceville, and William Schlough, of Wheeler.

Construction.

LOS ANGELES, CAL.—The Pacific Telephone & Telegraph Co. will spend $16,700 on miscellaneous improvements to its system in this city.

IRON MOUNTAIN, MICH.—An appropriation of $23,130 has been made by the Mountain States Telephone & Telegraph Co. for the construction of a new toll line from Iron Mountain along the county road to Sagola, Channing Witch Lake and Republic.

CORINTH, MISS.—The Stantonville Telephone Co. has completed plans for the erection of a new exchange building, which will cost, including new equipment to be installed, $9,000.

LINWOOD, N. J.—The Bell Telephone Co. of Penna. is planning to install and operate an exchange at Sea View, N. J. (Not a P. O., mail from Linwood.)

NEW YORK, N. Y.—The New York Telephone Co. will add seven stories to its Walker-Lispenard exchange building, at an estimated cost of $500,000. The building is now 17 stories high and will be increased to 24 stories.

SCHENECTADY, N. Y.—Work is in progress on the foundation of the new building of the New York Telephone Co., which when completed will cost in the neighborhood of $50,000.

WILSON, N. C.—Carolina Telephone & Telegraph Co. will expend $15,000 in improving its system.

PHILADELPHIA, PA.—Improvements and additions to cost $8,137,000 are provided for in the budget for 1914 of the Bell Telephone Co. of Penna. Among the local improvements for which provision has been made are included a new toll line from this city to Ambler, to cost $19,000, additional underground cables, to cost $45,000, and a new exchange and office building. A new exchange building will also be erected at Pittsburgh.

EAST PROVIDENCE, R. I.—Plans have been completed for the erection of a new two-story exchange building for the Providence Telephone Co. in this city.

SPARTANBURG, S. C.—The Southern Bell Telephone & Telegraph Co. is planning to make extensive improvements to its system in this city, which when completed will cost approximately $225,000.

OSHKOSH, WIS.—The Wisconsin Telephone Co. is erecting an addition to its exchange in this city which will cost $40,000 and will spend about $15,000 more in increasing its switchboard capacity.

Underground.

ALBION, MICH.—The Michigan State Telephone Co. proposes to install underground circuits in the business section of this city, entailing an expenditure of $8,000.

PORTSMOUTH, OHIO.—The Portsmouth Telephone Co. is planning to renew its entire local system and will place its wires in underground conduits wherever feasible.

FRANKLIN, PA.—The city commission has ordered the Bell Telephone Co. of Pennsylvania to place its wires in the business section of this city underground.

PHILADELPHIA, PA.—The directors of the Bell Telephone Co. of Pennsylvania have appropriated $300,000 to begin the work of placing telephone and telegraph wires between New York and Philadelphia in underground conduits.

OGDEN, UTAH.—The Mountain States Telephone & Telegraph Co. is planning to install an underground conduit system in this city, to cost approximately $100,000.

WAUSAU, WIS.—The Wausau Telephone Co. has made an appropriation of $25,000 for improvements to be made during the coming spring and summer. The plans include a considerable number of extensions to its underground system.

Financial.

HINDMAN, KY.—The Hindman Telephone Co. has increased its capital stock from $5,000 to $7,000.

SANDLICK, KY.—The Sandlick Telephone Co. is planning to overhaul and rebuild its lines and also to construct a new line to Hindman, a distance of 20 miles.

VIPER, KY.—The Perry County Telephone Co. has increased its capital stock to $2,000. The company is planning to construct a new toll line from this city to Hazard, Ky.

BENTON HARBOR, MICH.—The Michigan State Telephone Co. is making arrangements to install two additional sections to its switchboard in this city, at a cost of $4,134.

CROSWELL, MICH.—The Croswell Telephone Co. has been authorized by the Michigan Railroad Commission to issue $25,000 worth of capital stock and to sell $15,000 worth of it at present. The new company is taking over the Fremont Farmers' Telephone Co., of Sanilac county, Mich., and will improve the property.

LANSFORD, PA.—The Carbon Telephone Co. has increased its capital stock from $6,000 to $12,000. S. H. Mounce, Jr., is secretary of the company.

LINESVILLE, PA.—The Linesville Telephone & Telegraph Co. has increased its capital stock from $25,000 to $100,000. W. P. Walton is secretary of the company.

JANESVILLE, WIS.—The Rock County Telephone Co. has filed an amendment to its articles of incorporation, increasing its capital stock from $100,000 to $150,000, for the purpose of making betterments and extensions to its system. F. B. Farnsworth is president and Richard Valentine, secretary.

WAUSAU, WIS.—The Wausau Telephone Co. has increased its capital stock from $80,000 to $120,000, to consist of 2,400 shares of $50 each. Nathan Heinmann is president, and James Montgomery, secretary.

WESTBORO, WIS.—The Westboro Telephone Co. has been authorized by the Wisconsin Railroad Commission to issue $2,500 worth of bonds for the purpose of extending its lines.

Elections.

CLAYTON, CAL.—The directors of the Mt. Diablo Telephone Co. have elected the following officers for the ensuing year: President, Benj. Frank; vice-president, Henry DeMartini; secretary and treasurer, T. O. Graves. The following are the trustees: Benj. Frank, T. O. Graves, Henry DeMartini, John W. Atchinson, Joseph Frank, T. K. Duncan and G. B. Bottini.

SAN FRANCISCO, CAL.—The stockholders of the Pacific Telephone & Telegraph Co. have elected the following directors for the ensuing year: J. C. Ainsworth, E. C. Bradley, J. C. Cebrian, William H. Crocker, F. G. Drum, F. W. Eaton, M. Ehrman, G. D. Greenwood, Timothy Hopkins, Homer S. King, Walter S. Martin, G. E. McFarland, H. D. Pillsbury, J. M. Quay, H. T. Scott, O. J. Woodward, Theodore N. Vail. The directors organized by electing the following officers: Henry T. Scott, chairman of the board; G. E. McFarland, president; H. D. Pilsbury and J. M. Quay, vice-presidents; F. W. Eaton, secretary and treasurer; F. C. Phelps, general auditor. The executive board is composed of William H. Crocker, F. G. Drum, F. W. Eaton, Timothy Hopkins, Homer S. King, G. E. McFarland and Henry T. Scott, chairman.

BONDVILLE, ILL.—At the annual meeting of the Bondville Telephone Co., officers and directors were elected for the ensuing year as follows: President, C. C. Samuelson; vice-president, J. C. Flowers; treasurer, Herbert Barker; secretary, Asa Franklin; directors, Herman Wascher, S. H. Abrahams, C. H. Foster, C. W. Pfiester and Cliff Blank. G. B. Talbot was appointed manager.

ONEIDA, ILL.—The Oneida Telephone Exchange has elected officers for the ensuing year as follows: President, S. J. Metcalf; vice-president, J. P. Milroy; secretary and treasurer, J. F. Epperson. The company is planning to make a considerable number of improvements to its system.

DANA, IND.—At the annual meeting of the Citizens Telephone Co., directors were elected as follows: Harry Bales, A. B. Dicken, R. V. Thompson, T. J. Skidmore, Joe Bonwell, L. E. Brown, Al Rice, Charles Thomasmyer and Clarence Hooker.

HUNTINGBURG, IND.—The annual meeting of the stockholders of the Dubois County Telephone Co. was held recently, at which the old board of directors was re-elected as follows: H. Landgrebe, P. Dilly, H. C. Rothert, Frank Dittmer, A. H. Koerner and Ernst C. Dufendach. The board later organized by electing the following officers: President, H. Landgrebe; vice-president, H. C. Rothert; secretary, Ernest C. Dufendach; treasurer and general manager, P. Dilly.

IOWA FALLS, IOWA.—The stockholders of the Iowa Falls, Ellis & Buckeye Mutual Telephone Co. held their annual meeting recently, at which the following officers were elected for the ensuing year: H. J. Ellis, president; A. Armstrong, vice-president; R. F. Skiff, secretary; N. A. Thines, treasurer; I. C. Bullis, L. E. Thorpe and R. S. Hillhouse, together with the officers, constitute the board of directors.

DULUTH, MINN.—At the annual meeting of the board of directors of the Zenith Telephone Co., the following officers were elected: E. H. Moulton, president; H. B. Knudsen, vice-president; G. W. Robinson, treasurer; Frank E. Randall, secretary; A. J. McCulloch, assistant treasurer and general manager. The board of directors is composed of the following: E. H. Moulton, D. M. Neal, Frank E. Randall, G. W. Robinson, H. B. Knudsen, C. B. Randall, E. L. Bradley.

PELICAN RAPIDS, MINN.—The annual meeting of the Pelican Telephone Co. was held recently and a profitable business year reported. The following officers and directors were elected for the ensuing year: President, C. D. Haugen; vice-president, O. G. Helseth; treasurer, O. M. Carr; directors, O. J. Morrison, E. Aarness, J. F. Logan and P. K. Peterson.

BELGRADE, MONT.—At a recent meeting of stockholders of the Dry Creek Telephone Co., J. M. Moore was chosen president; G. D. Tribble, vice-president; Wesley Davis, secretary; C. F. Angell, chairman, and Ralph Adams, John Yates and W. D. Brownell trustees for one year.

ADAMSVILLE, OHIO.—The Adamsville Telephone Co. held its annual meeting recently and elected the following directors for the ensuing year: J. W. Elsea, F. M. Slater, B. H. Spicer, C. A. Geyer, G. W. Williams, C. O. Hardy and E. C. Jordan.

BRENHAM, TEX.—The Brenham & Mount Vernon Telephone Co. held its regular annual meeting recently and elected the following officers to serve the ensuing year: H. Weidner, president; William Hueske, vice-president; Louis Sternenberg, treasurer; Leon Landgraf, secretary.

Franchise.

DRYARD, WASH.—Charles Roundtree and C. H. Sweeney, of Klaber, have been granted franchises in both this city and Doty and will install and operate an up-to-date telephone system in the near future.

Miscellaneous.

EDDYVILLE, IOWA.—N. B. Halloway, owner of the Eddyville Telephone Co., has sold the property and interests to Dr. J. S. Appleman, of Chicago. Mr. Appleman also owns the Oskaloosa Home Telephone Co., of Oskaloosa, Iowa.

LEES SUMMIT, MO.—The Prairie Telephone Co. has filed a certificate of dissolution.

OKLAHOMA CITY, OKLA.—The exchange of the Pioneer Telephone & Telegraph Co. in this city was recently destroyed by fire.